NOVEMBER 1963

approach

THE NAVAL AVIATION SAFETY REVIEW

- Is the LSO Forgotten?
- Mugs Goes to School...
- Nosewheel Up Landings...
- I'm Not Tired ...

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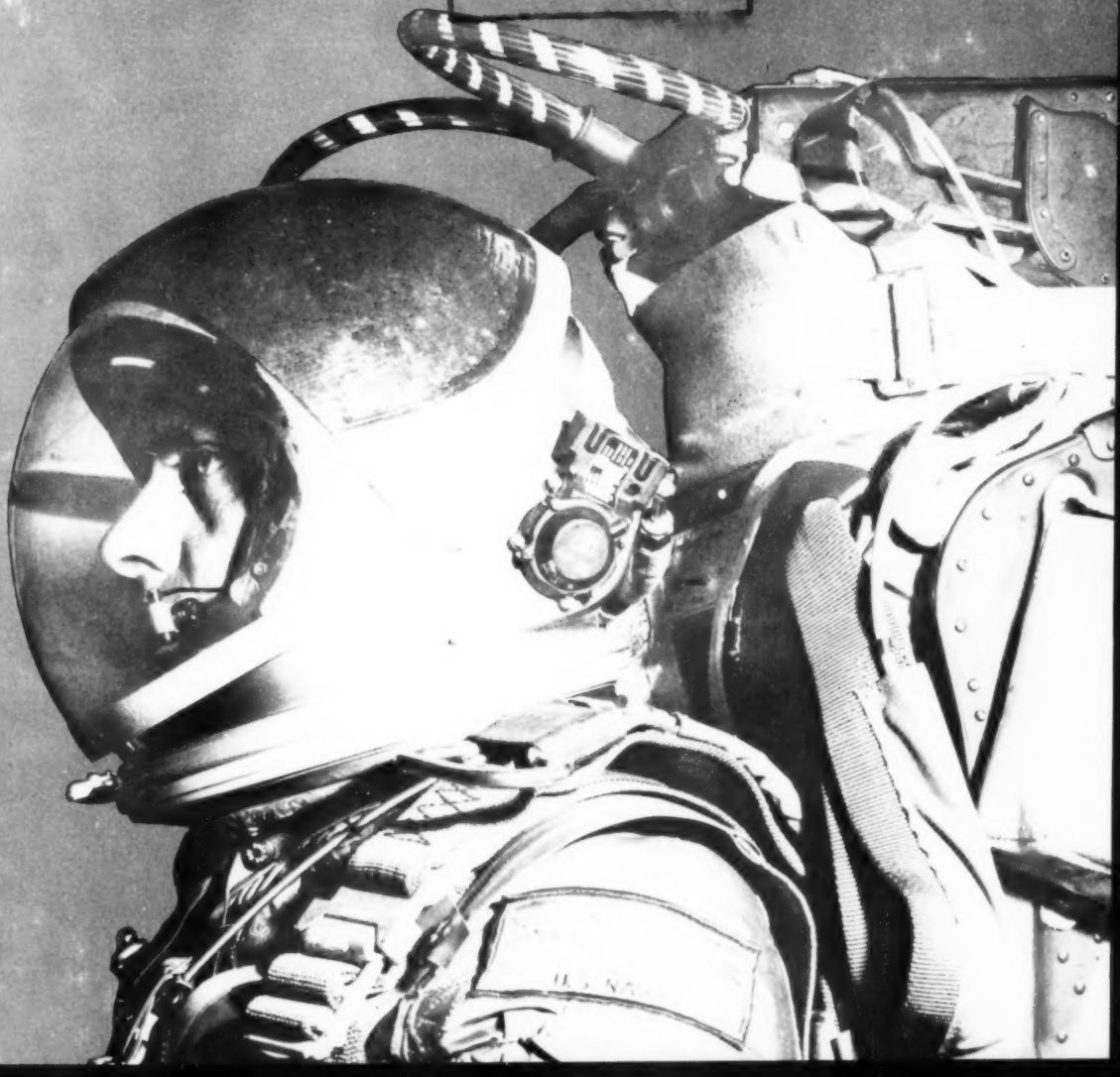


THE CARE AND FE

FLAT ON YOUR FACE

ALTHOUGH the group of photos representing some case histories of "nosewheel stuckupitus" might give the impression that an epidemic is sweeping our air stations, such is not the case. It's not a contagious disease and only strikes at odd times and random locations. On an average of once a month some pilot will notice the symptoms in his airplane and after examining the patient, will find he has an authentic case on his hands.

Assuming he has not played footsie with a pitching deck or some such damaging maneuver, a pilot who is stuck with a balky nosewheel may ask himself how it could happen. Tech reps are notoriously quick in pointing out the alternate systems, emergency systems, fail safe design, straight-forward engineering of their product, etc., and you wonder how a landing gear could malfunction.

After digging through a stack of accident and incident reports dealing with nosewheel-up landings, it becomes evident that the tech rep is

NFEEDING OF A SICK NOSEWHEEL.

essentially correct: When the airplane leaves the factory the landing gear is in good shape. But the manufacturer cannot guard against such things as "maintenance personnel neglecting to connect the nose gear retraction link assembly to the link assembly."

Then too, there is the "Murphy." Who is to blame for these—maintenance or manufacturer? In theory the design should make it impossible to "cross-connect leads during replacement of landing gear switch" or "install landing gear timer check valve backward." All this, however, is another story. Whatever the origin of a nosewheel-up situation the pilot must finish the job.

What have been the final results? Guidelines and advice on getting the cripple safely onto the runway are contained in the majority of NATOPS and Flight Manuals. How do they work out in practice? Are any predictions possible or does the pilot take pot luck as far as damage to the aircraft and personnel injury are concerned?

Nosewheel-up landings have been common enough to give some substance to the ready-room belief that the chance of pilot injury is slight or non-existent. We can confirm it with recorded history. In 43 nosewheel-up landings in the last four years (12 classed as accidents and 31 as incidents) none contained mention of personnel injury.

How about the airplane? Naturally the pilot would like to keep damage to a minimum. Although it is dangerous to anticipate, we can come up with a few general conclusions as to what will happen.

Let's first look at the accidents.

Of the 12, six were precipitated by a carrier landing (four at night) so the aircraft were damaged before they were bingoed to the beach. Even then there was only one overhaul out of the six. The five others were substantially damaged.

One of the remaining six must be considered

an "abnormal" nosewheel-up landing. An S-2 pilot made a full-flap, hook-down approach and miscalculated. Instead of landing short of the midfield arresting gear, he touched down on the threshold and made a wrong direction engagement of the abort gear.

There was no time to feather and the nose pitched forward onto the runway. Both engines received sudden stoppage, the port prop was damaged and the starboard prop blades shattered, punching expensive holes in the fuselage. Damage was classed "substantial." This accident occurred before the S-2 NATOPS clearly vetoed the use of field arresting gear for nosewheel-up landings.

It can be considered abnormal in two ways. First, because of poor pilot technique. Second, because in eight other S-2/C-1 nosewheel-up landings seven were classed "incidents" and only one was called an "accident."

If we eliminate the "abnormal" accident from the group, one accident versus seven incidents makes it clear that the accident is the exception for the S-2/C-1. But that's about as far as we can go. The one aircraft which ended up with the accident was piloted as well as those with the incidents so you can't do any hard and fast forecasting about the outcome.

Since the S-2/C-1 has already come into the discussion it can be used to illustrate other factors in the nosewheel-up story.

Comparing the Flight Manual with the NATOPS manual may be rewarding, either for what they do say or don't say. For example, the P-2 publications explain emergency gear-lowering procedures in detail but say nothing on how to go about handling a nosewheel-up landing if the emergency procedures don't work. Of course, it may be felt that such mention is unnecessary as a nosewheel-up landing in the P-2 is extremely rare.

The S-2 is unique in that the basic airplane has provided two variants to the Fleet, the C-1 and E-1. Cross-checking the manuals on the three models also brings out some variations.

For the S-2 both the NATOPS and new combined NATOPS-Flight Manual recommend that no field arrestment be attempted in a nosewheel-up situation. This is to prevent possible injury from pitch down after arrestment and may also be due to the need to feather the starboard prop before the nose touches the runway. A field arrestment can possibly leave insufficient time for feathering.

You might expect the same no-arrestment recommendation from the C-1 and E-1 manuals but no mention is made in them.

When talking about flaps for the three models some apparent discrepancies appear which are not discrepancies at all as long as the NATOPS Manual is followed.

The Flight Manuals are unanimous in saving "flaps up" for the approach and touchdown. However, the C-1 NATOPS says "full flaps" (for aerodynamic reason), and the S-2 says make normal approach (full flaps) with the copilot raising the flaps after touching down and feathering the starboard engine. The E-1 makes no mention of flaps (a change is being made).

On handling the nose position after touchdown, the three Flight Manuals are in agreement: "Hold control wheel full back to keep nose up as long as possible." The C-1 NATOPS goes along with this (chance to get an aft C.G. and consequent soft nose touchdown) but the S-2 NATOPS as-

What do you mean, there's no wheel in there!

RESULT OF MIDAIR was loss of radome and jammed nosewheel for this A-3. Preparations for landing included mid-field arresting gear, foamed runway and LSO with runway portable.

sumes a foam strip has been laid on the runway then says, "Lower nose onto first part of foamed area. Do not let the nose fall through." The E-1 NATOPS again makes no mention of the subject.

Once the nose is on deck the three Flight Manuals are again in agreement on the use of brakes to shorten the slide. Their advice: "Don't." The S-2 NATOPS agrees but the C-1 and E-1 NATOPS are silent about this.

It may sound as if the Grumman brood is being picked on. It isn't that way at all. The three models provide in a small way, a good example of pros and cons and unknowns to be found in crosschecking manuals for all Navy aircraft on the subject of nosewheel-up landings.

As far as field arrestments (or MOREST) there are two aircraft which should *not* try for a wire when the nosewheel is up, the S-2 and F-4. A specific O. K. to make an arrestment is given to only two aircraft, the A-3 and A-4. That leaves quite a few models which allow "pilot's choice." And the pilot's choice has apparently fallen into something approaching tradition among several models.

In eight F-8 incidents and three accidents, only once was an arrestment attempted. In that single case the nose was lowered to the runway prior to reaching the gear and the hook missed. The accident board said later that there was no real rule on use of the arresting gear for the F-8 and from the record it appears the "no hook" technique is a successful guideline. None of these cases involved the use of foam on the runway. That too may be a guideline.

Conversely, the pilot's choice tends to regard A-gear and foam as something of a standard for the F-9 series. In seven incidents, there are no F-9 accidents in the collection of nosewheel-up reports, there are three arrestments, one attempted arrestment, and one case where the fuel state did not permit rigging the mid-field gear or spreading foam. Two cases involve foam on the runway.

Although there are fewer cases on record, it appears both the F-11 and F-1 series are landed into the arresting gear with foam on the runway whenever possible.

Foam and arresting gear may be favored for the three models mentioned above but there is no indication that damage was greater when the slide-out was on a dry surface and without arresting gear. So it's right back in your lap. Plain or fancy seems to be equally successful.

Where there is a comment in the publications on how to set up the landing, it usually says "normal approach" or "normal pattern" with perhaps a specific item referring to a particular aircraft. The F-3, for example, recommends a low sink rate landing; the F-9 says flaps down, speed brakes down, nose high with low sink. Several A-3 pilots who have ridden through a nosewheel-up landing strongly endorse lowering the lower escape hatch to keep the nose section off the run-

way during early stages of the slide much as the dive brakes do in the F-9.

After touchdown the pilot's next problem is what to do with the nose. Should he hold the stick or wheel full back and hold the nose off as long as possible? Or, should he fly the nose to the deck before control is lost?

Some manuals say one thing and some manuals say another; nine say hold the nose up as long as possible, a dozen say ease or fly it to the runway before loss of control. Ten manuals make no mention of any technique. Despite the language used, we must believe that in no case is it intended to hold the nose up so long or so high that when elevator effectiveness vanishes, the nose falls through abruptly and hits the deck with a heavy force.

All right, now the nose is on the runway. What about brakes? If you are flying the A-6 or the F-4 the manual says apply brakes. In 14 other manuals "no brakes" is recommended. The majority of the manuals, some 20 of them, make no mention of what to do with the brakes.

Smoke and scorched paint from small friction fires sometimes follow a nosewheel-up landing but a major fire is extremely unlikely. Unexpected collapse of an F-4 nose strut on landing rollout caused a major fire in recent months but of the two F-4 nosewheel-up landings, both bordered on the routine.

There are other things a pilot might like to know. For example, after a commercial transport made a nosewheel-up landing, the pilot suggested that the "landing run distance" . . . be included in the Emergency Landing and Evacuation section of the Flight Manual.

It would be nice to be able to give such figures as distance traveled before the nose is lowered to the runway; approximate airspeed at which the nose is best lowered, distance the nose will slide on the runway, but unfortunately, about all we can provide are a few figures for certain aircraft. You will have to figure your own "average" from the ones furnished. The majority of accident and incident reports do *not* contain this information.

In quick summary of the no nosewheel situation we can say:

- Injury improbable
- Major fire unlikely
- An incident is more likely than an accident
- Damage not substantially affected by runway conditions; bare, foamed or field arresting gear.

All apparent discrepancies set forth in this article have been forwarded to specific NATOPS model managers for consideration and appropriate action. Standardization of NATOPS manuals was an agenda item discussed at the recent NATOPS Review Conference held in Dallas, Texas. – Ed.

DISTANCES, SPEEDS OF NOSEWHEEL-UP LANDINGS

AIRCRAFT MODEL	T-28	(T2J) T-2	(S2F) S-2	(TF) C-1	(P2V) P-2	(F9F) F-9	(F8U) F-8	T-34	(GV) C-130	(A3D) A-3	(F4H) F-4	(FJ) F-1
APPROXIMATE DISTANCE AIRCRAFT ROLLED BEFORE NOSE LOWERED TO RUNWAY	1000	2000 3000	2000 3900 4800		2000	2000	3500 4000					4000 3500 3100 1800
APPROXIMATE AIRSPEED WHEN NOSE WAS LOWERED			35kts 40-45 30			95 100 100	95 90 80 105 80	20	50			70 90
APPROXIMATE SLIDE DISTANCE ON NOSE	600	3000	300 700 1000	1000		500 1600 2100 1000 2000 2000	2100 2500 1500 3000 2800 1000	114 219		2500 3100	2000 3000	1700 2000 1500 1200 2000

This item is based on an actual incident which is far from isolated and is published in hopes of calling attention to the Firing Notice.

They're shooting real bullets!

By LCDR C. O. Wakeman

The USS NEVERSAIL arrived at the rendezvous point, tuned her UHF receivers and finally heard the plaintive cry, "Big Boom – Big Boom, this is Tractor, over." Orbiting overhead was a UB-26J (still commonly known as a *Jig Dog*) ready to commence event 0121, a Z-6G surface to air exercise. The required brief between the ship and aircraft was accomplished with a minimum of transmissions and the exercise was started. After the third run, a frantic voice was heard over the UHF – "Tractor, this is Big Boom, no firing this run, another aircraft is in the area, out" and in the background was heard the bridge screaming over the MC "Cease fire," cease fire – there's a * @+#?!! *Stoof* overhead."

Since aircraft services are at a premium and time on station is limited, it is understandable that the DD skipper was rather upset, not because his ship almost scored an S-2 (S2F) kill, but because he was losing valuable shoot time.

The immediate questions to consider in a case such as this are:

1. Why was he in a firing area?
2. How does a pilot know when and where firing is being conducted?

The first question is rather easy to answer . . . "Who knows?"

If the pilot had read the Daily Firing Notice, he possibly would not have been there.

The answer to the second question is contained in a message with routine precedence or lower, but with a safety precedence of flash. . . . A firing notice similar to the one shown at the end of this article is sent out at 1600 daily by the local Warning Area Scheduling Coordinator. It is usually addressed to the Fleet Air Detachment and information to the local NAS and satellite fields. This notice contains the time, type and location of any and all firing exercises taking place within the Warning Area.

As it is with so many everyday standard messages, the firing notice soon becomes commonplace. It is rapidly skipped over or at best, skimmed, in the morning rush to check the required action message traffic received during the night. It is understandable that an op-immediate message from the Task Group Commander ordering the Air Group to "Load aboard" yesterday is more interesting, yet that firing notice is also an action required message to every Air Detachment Unit. It is, in essence, a local area NOTAM.

The *overlooked* often becomes the source of a serious safety problem and so it is with the firing notice. The pilot who fails to check the NOTAMs prior to an IFR airways flight, is wide open to censure; yet our friend, the *Stoof* driver can ignore the firing notice and be the rule rather than the exception.

These notices are not the figment of someone's wild imagination. Those ships are firing real bullets that make large holes in your pretty iron birds. So remember, all you bird machine drivers: *Read - Heed - Brief and keep your feet dry*

FIRING WILL BE CONDUCTED IN THE FOLLOWING NARBAY OPAREAS ON 1Ø AUG 1963. ALL TIMES LOCAL.
NARBAY 11, 12, 13, 14 Ø8ØØ-Ø93Ø
SFC TO 30M FT NAL-1-AD
NARBAY 11, 12, 13, 14 11ØØ-123Ø
ETC.
NARBAY 18, 19 Ø8ØØ-11ØØ
ETC. Z-6-G
BT

FANTAIL D

I suddenly realized that the chute had begun encircling me.

One morning last December I manned a *Crusader* for a tactical mission involving the defense of a specified area against attacking "enemy" aircraft. Prior to my launch at 0840, the aircraft checked out in all respects. Advised by the tower of "enemy" fighter aircraft close aboard, I immediately selected afterburner after launching, to rapidly gain airspeed and altitude in order to counter any incoming attack.

The flight was normal in all respects with the aircraft functioning properly until 0922. At that time, at about 400 knots IAS and at an altitude of 1000 feet, I closed on a reported bogie. Suddenly the engine oil and hydraulic pressure warning light came ON. The PC system gages and the utility hydraulic gage indicated normal. I then checked my oil pressure gage and it was reading ZERO.

I immediately called the ship and reported I had an emergency, the nature of my emergency, and that I must come aboard immediately. I then asked for the delay expected and was advised 15 minutes or thereabouts. I then requested all possible speed in achieving a clear deck.

I was about 15 miles from the ship and realizing that I would need 89% power to get aboard, I set up my power. I climbed to 2500 feet and commenced dumping excess fuel. I switched to tower frequency but had difficulty raising them. I finally made contact and advised them of my emergency and that I could only expect to remain airborne a total of 8 minutes. Then I proceeded

aft of the ship deciding to make a straight-in approach, thereby keeping my throttle adjustments as small as possible. With splendid effort, the ship had a clear deck 4 to 5 minutes faster than anticipated. At "clear deck" I was about 7 miles off the port quarter, 2500 feet, and 290 knots IAS. This was about 6 or 7 minutes after the warning light had come ON. I decided to dirty up at 2 miles, so I popped speed brakes momentarily in order to descend and still keep my airspeed under control. Level at 1500 feet; 5-6 miles astern; 260-270 knots IAS I felt a rumbling vibration followed seconds later by a loud screech with additional vibration. The tachometer was falling off. I added a small amount of throttle with no discernible results, then ejected. I did not transmit "May Day" or the fact that I was ejecting because I had an escort, the ship held me, and I did not want to waste vital seconds.

The ejection was normal. I tumbled quite a bit but all my survival equipment stayed with me and intact. My visor was down and oxygen mask on. During the seconds of my descent I removed my oxygen mask and released the rocket jet fitting on my left leg. As I approached the water I twisted around to face the direction of drift and hit the water in this position. I went under about 2 feet or so, surfaced and then was dragged a short distance by the chute. I successfully released the chute and inflated my Mark 3C life preserver.

As I began pulling in the survival pack to get to my raft *I suddenly realized that the chute had begun encircling me* and that the shroud lines were winding themselves around my body. This commenced the most critical part of the entire accident. The sea state was moderate and I was swallowing a lot of salt water. Although I did not become actually ill, the effect was extremely unpleasant and it seemed to add to the general dissipation of my strength. I was therefore faced with the decision to continue after the survival pack (which was entangled by this time with the chute) and inflate my raft, or try and free myself from the chute and shroud lines with which I was becoming more and more entangled. I chose the latter course of action because I was close to the ship and the shroud lines were presenting a rather pressing situation.

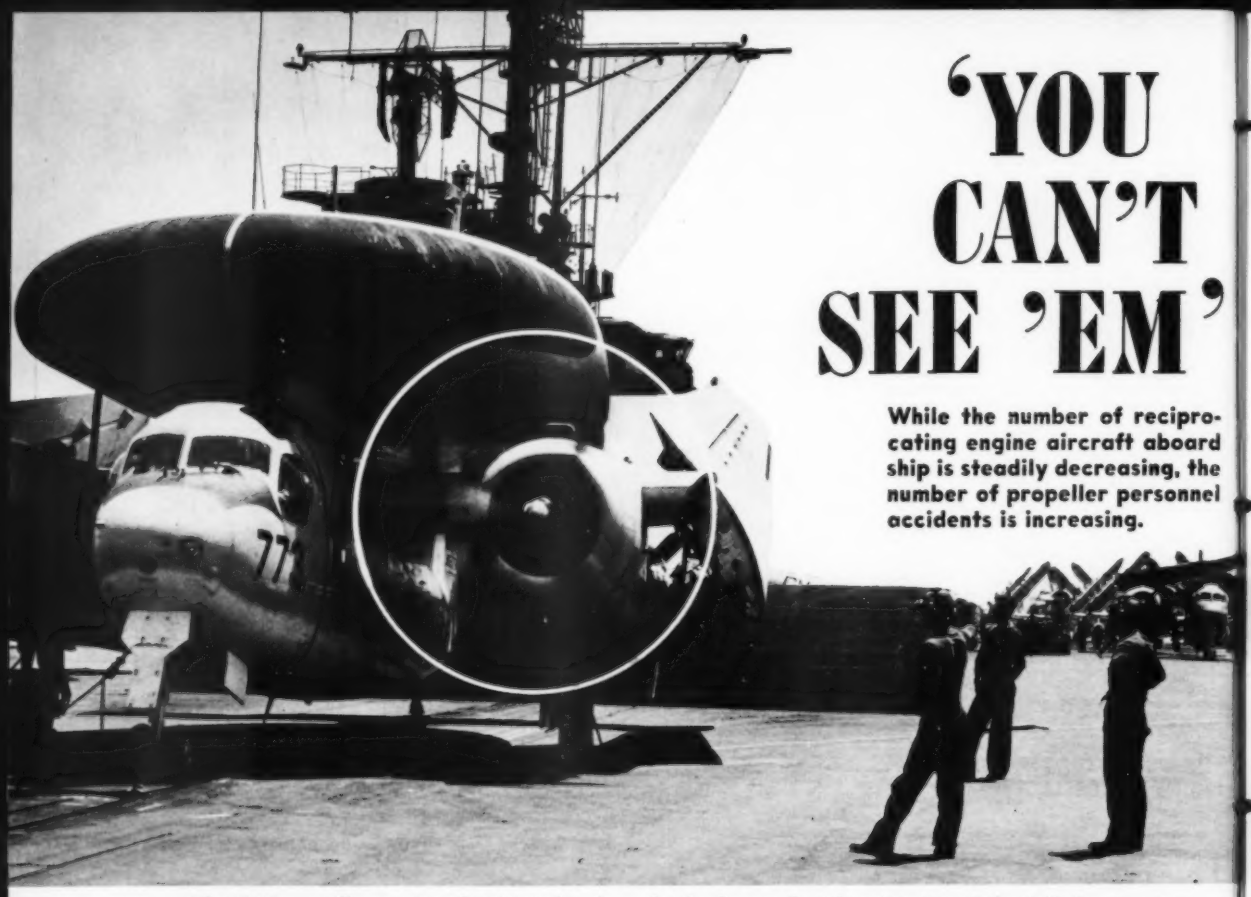
The harder I struggled, it seemed, the worse the situation became and I decided promptly to jettison those items of equipment that were entangled in the chute and shroud lines. I disconnected my survival pack and released my leg straps. As the survival pack drifted down it tended to pull the chute, with which it was entangled, down with it. Naturally this in turn pulled some of the shroud lines away and down. Unfortunately, there were several shroud lines tightly wrapped around the calves and ankles of my legs. At this point I was tired, weak, and slightly nauseated and if it had not been for the shroud cutter affixed to my torso harness I am sure the situation would have become critical. The shroud cutter cut the taut shroud lines quickly and I was free.

Apparently, I was momentarily lost by the rescue aircraft for I saw only an E-1B (WF-2) in the distance. I fired my pistol once then placed it back in its holster and fired a day flare. This fizzled and worked for only 10 seconds or so, but it was sufficient to be spotted. The helicopter picked me up minutes later and the trip to the ship was uneventful.

All my survival equipment worked as advertised with the exception of the flare. I believe, however, that my Mark 5 anti-exposure suit permitted more water to seep in than it should have, even though I had my neck band tight. In all, I believe I was in the water about 30 minutes prior to being picked up by the helicopter with the first 20 minutes struggling to free myself from the entangled chute and shroud lines. ●

'YOU CAN'T SEE 'EM'

While the number of reciprocating engine aircraft aboard ship is steadily decreasing, the number of propeller personnel accidents is increasing.



The E-1B propeller arc is only 10⅝ inches from the fuselage and within 6 inches of the folded outer wing panel. Can a man safely walk between the nacelle and the fuselage? How about on an S-2?

Some squadrons are never exposed to propeller hazards until aboard ship, as in CVA ops. Groups that operate the prop types are of course aware of the hazards, but may have never operated under the crowded flight deck conditions. With the increased tempo of night carrier ops, prevention becomes even more vital, since many of the prop accidents occur then. Personnel are not avoiding props either because of ignorance of the hazards, previous beach habits or conditions do not allow their avoidance.

Unlike the jet engine the reciprocating engine does not have to be running to be dangerous. A reciprocating engine contains a magneto which may cause the engine to fire if the propeller even moves. High winds over the flight deck sometimes cause a propeller to rotate slightly. A hot engine which has just returned from a flight may contain a hot spot within a cylinder. If the engine is secured improperly or if there is a malfunction in the ignition system, the heat of compression due to prop rotation may cause the engine to fire. *Just because a propeller is stationary it is not necessarily safe.*

Propeller safety must be evidenced by deeds as well as words. A lecture on prop hazards or posters and signs will not necessarily alter a man's habit patterns. Any man who walks through a prop arc whether in port or at sea should be stopped and have the hazard explained. Propeller safety is an all-hands effort—pilots, crewmen, maintenance and flight deck personnel.

Maintenance officers can help prevent prop accidents, too. It has been noted that the electric cords on many starting units are so short as to endanger mechs and plane captains by requiring starting units to be parked too close to prop arc. While the standard length of these cords is 30 feet, over a period of time—what with snapping them off accidentally when driving off, etc.—

you can end up with a dangerous nub. Check yours—if they are getting too short, replace them. After all, funds are expendable, people are not. (P.S. MUGS says that long cords also keep vehicles further away from aircraft and collision damage possibilities.)

These six rules, if followed by all personnel, will help eliminate propeller accidents:

1. Go to each prop type aircraft aboard, look at the prop arc and learn safe areas around the aircraft.

2. Never walk *or let anyone else walk* through a stationary arc unless it is required by his job.

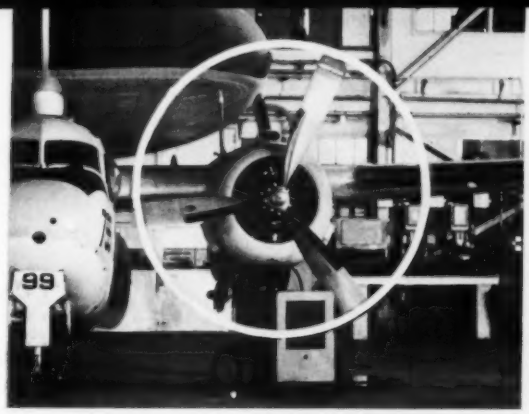
3. Never walk or stand in front of a rotating prop. The wind or jet blast may blow you into it.

4. If possible keep the area around propellers clear so that others can avoid them and not be distracted.

5. Never turn your back on a rotating propeller.

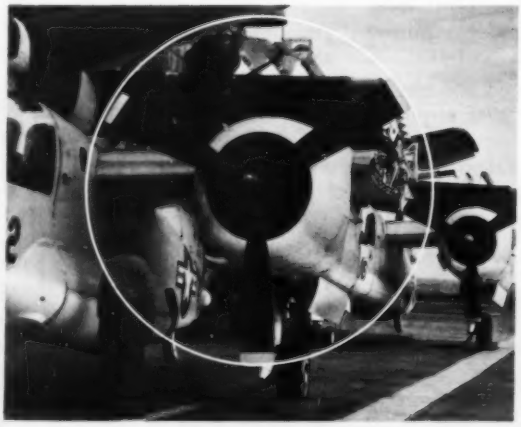
6. At night if disoriented, stop and get your bearings before moving. Develop safe habits. Learn how to avoid 'em, because you can't see 'em!

Based on material and photographs supplied by LT M. C. Drees, formerly ASO of VAW-12 and now in USS Saratoga, as well as suggestions by LCDR E. R. Doering, address unknown; and LT John G. Wurth, ASO of VS-29.-Ed. ●



It's easier to see how the *Willy Fudd* prop arc extends beyond the wingfolds in this head on view with props still. Drill yourself and others into the habit of avoiding prop arcs at all times. A shortcut step during maintenance may set the stage for forgetfulness during ops!

The grandaddy arc of all. The A-1 different from the twin-engine carrier prop aircraft, the wingfold here is well clear of the propeller arc. The lower portion of the arc is forward of the propeller hub.



Does this man's job require him to stand in the propeller arc? Notice that the propeller arc *extends well beyond the wingfold!*

It's apparent from the new E-2, and its COD version the C-2, that props will be around the flight deck for a long, long time.

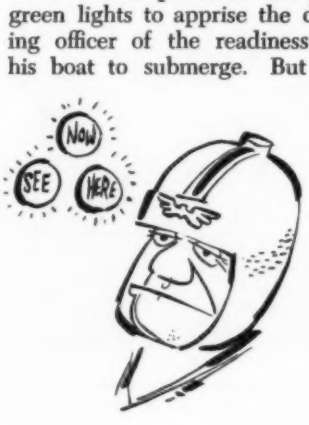
WHY DON'T

In most fields an expert is someone from out of town who is interested in the subject at hand. Airplane cockpit design, however, like patriotism, leadership, and child-raising, is an area in which nearly everyone considers himself an expert. If you don't believe it, just ask him!

The use of check-off lists draws a lot of interest when some pilot (a) misuses his mike selector switch in a multi-pilot airplane, or (b) makes an inadvertent wheels-up landing. These are self-advertising errors. None of us will ever know the number of less spectacular check-off list items that go uncompleted every day. Omissions are especially likely in single place airplanes and busy situations such as an unexpected waveoff from the tower, a near-miss with an itinerant light plane, or a radio call requiring an answer right at the 180.

We have reduced the check-off lists in single pilot airplanes to short lists of essential items. We have also engraved them on edgelighted plastic so we can use them at night without devoting one hand to holding the flashlight. We have not, however, provided any sure cure for interruptions or broken habit patterns. Until we do, there appears to be little hope for complete elimination of inadvertent wheels-up landings and other check-off list omissions.

The name, "check-off list," implies that items are checked off as they are completed. This is done physically with pencil and paper in shipboard preparations for getting underway. The record is available at any time during the procedure to show which items have been completed and which have not. Our submariner friends long ago built themselves a panel of red and green lights to apprise the diving officer of the readiness of his boat to submerge. But in



T WE BUILD...

by LCDR Walt Spangenberg

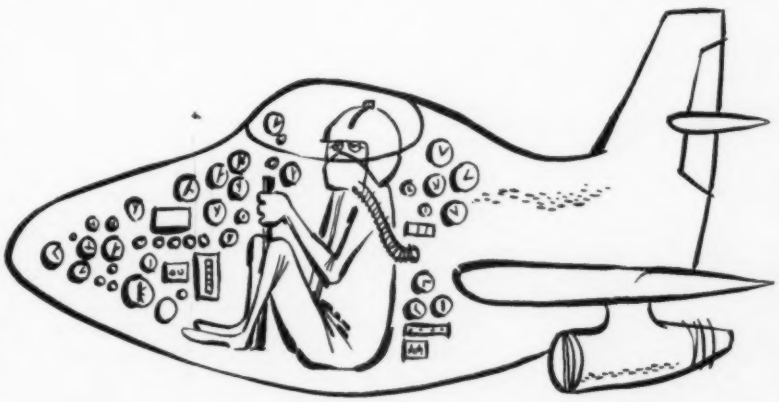
spite of all the sophistication and expense of modern Navy airplanes, we still rely on the pilot's memory to keep track of which check-off list items have been completed and which have not.

Several recent Navy airplanes have incorporated advisory panels, or groups of indicator lights, to apprise the pilot of any condition which is of great interest, but not indicative of an immediate crisis. These advisory panels represent a significant advance over the older arrangement of indicator lights scattered all over the cockpit, wherever space allowed.

A logical extension of the advisory panel idea would seem to be a ladder of indicator lights representing the items in the landing or takeoff check-off list, with a button or switch available to the pilot to illuminate these lights when he is ready to start his check-off procedure. Some of the lights are already present in most Navy airplanes; others would have to be added. As each check-off list item is completed, such as wheels-down-and-locked, the appropriate light would go from red to green. This arrangement would permit interruptions without causing the pilot to lose his place on the landing check-off list. His task would require that all the lights be green prior to landing, or that he have a "green panel" suggestive of the "green board" required in submarine

operations prior to diving.

It can be said with justification that wheels warning lights have not eliminated wheels-up landings, and an argument might be then developed that lights are not the answer. The present arrangement of check-off list, wheel position indicator and wheels warning light in most airplanes is haphazard, however, and it may well be that increased order in the cockpit would produce improved pilot performance. The advisory panel landing checklist could replace both the present checklist and the wheels warning light. Such a checklist could probably be built so that it would require little more instrument panel space than is now devoted to landing and takeoff checklists. Retrofit in existing airplanes would doubtless require more money than the budget allows, but red-green advisory panel takeoff and landing checklists should be given consideration in future naval aircraft designs. ●



Notes from the

Purpose Re-emphasized

The monthly Accident Prevention meeting is held for the purpose of bringing together all personnel who can contribute, directly or indirectly, to the elimination of aircraft accidents. All hands are encouraged to submit agenda items for consideration. These items may be forwarded to the Aviation Safety Officer through department heads or the Assistant Flight Training Officer for Organized Reserve personnel. Agenda items should be accomplished by a brief discussion and recommendation, if possible. The cooperation of all hands in furthering this phase of our safety effort is heartily solicited.—*AAPB, NAS Seattle*

Restricted Areas

All pilots are reminded that ATC assumes no responsibility for flight through restricted areas. They will issue a clearance if requested, with the assumption that the pilot has already made arrangements to proceed through the area.—*NAS Willow Grove*

Fatigue

The commanding officer requested that all division officers check that their men do not work to a stage of fatigue. As pointed out, the flight crews have a crew rest policy and it behooves division officers of ground support personnel, to monitor this crew rest so men will be alert in the maintenance and handling of aircraft—*FAir-ReconRon One*

USAF Ground Training

Continual emphasis is placed on ground training. A short quiz is given during the daily pilots' meeting which greatly stimulates study of the aircraft systems and tactics. A four-hour ground school is conducted one day each week which places emphasis on intelligence, personal equipment and survival, aircraft recognition, and safety. The ground training, as well as all flight training, is very thoroughly documented, and complete training records are maintained on each individual.—*Exchange Naval Aviators USAF Report*

Personal Survival Equipment

The commanding officer of a Reserve Training Detachment reported numerous items of survival equipment missing from an aircraft that had been engaged in week-end airlift operations. Among those missing items were one-cell flashlights, day/night signal flares, and seat belt buckles. Further investigation revealed that the cost to this command to replace missing survival equipment is approximately $308 each month.

This equipment is designed for one specific purpose. That is, to save human lives in the event of an emergency. Misappropriation and/or misuse of this equipment is akin to intentional homicide. An individual in need of survival equipment is, indeed, in *urgent* need. If the one item he may need to survive has been removed, his last attempts will not be successful. Would *you* deprive a shipmate of his last chance on earth?—*Unit name withheld*

Safety Councils

Stoof Linemen

It was noted that some linemen on the VS line have been going between S-2s (S2F)s to pull chocks when engines are running on both aircraft and wings are folded. It was pointed out that the props extend beyond the wing butts and if aircraft are parked close together, this presents an extremely dangerous situation. It is recommended that engines on both aircraft not be turning over at the same time if the distance between aircraft will not safely allow a lineman to remove the chock—*NAResTraCom*

Toxicity of 7808 Oil

All squadrons are cautioned to take appropriate action to ensure that all personnel handling or using 7808 oil use all safety procedures in effect. This oil is highly toxic. NAS North Island supply is initiating action to have all containers of 7808 oil labeled TOXIC.—*HU-1*

Quiz Reveals

The results of recently administered Safety Quizzes on aircraft emergency procedures and system operations revealed that many pilots lack sufficient knowledge in these important areas. It is recommended that all Squadron Commanding Officers emphasize required ground instruction so as to improve the overall professional knowledge of assigned pilots.—*NAS Seattle*

Postflight Inspections

Postflight inspections are every bit as important as preflight inspections. All too often a minor discrepancy goes undetected overnight because a postflight inspection was not performed. Minor discrepancies discovered by this method may be corrected immediately and preclude the aircraft being downed by the morning preflight inspection. This will save everyone's time and ensure departures on schedule.—*NAS Seattle.*

GCA Minimums

Pilots of multi-engine aircraft operate in all types of weather and have become accustomed to the accuracy and reliability of the GCA unit. It appears that the pilots are reluctant to execute a waveoff when an approach deteriorates, but attempt to salvage the approach. It was felt that due to the proficiency of the GCA unit, pilots continue the descent through minimums and have been getting too low on their approaches. At minimums, GCA states, "you are ½-mile at GCA minimums." However, GCA will continue to give advisory information if the aircraft is within limits of the scope. This advisory information is not a directive or authorization to continue the approach through the ½-mile, 200 feet minimums. It is the pilot's responsibility to execute a waveoff if the runway is not in sight. It is very easy to slip into the habit of pressing a little lower in hopes of picking up the approach lights. This could prove to be a fatal habit, especially in hilly areas. GCA minimums are established for pilot protection and these minimums must not be violated.—*Argentia*

The LSO

Is he the Carrier's F

Observing the action on the flight deck of a carrier of the FORRESTAL-class today, one can scarcely help but marvel at the miracles of engineering and human skill which occur before him as routine matters. In the midst of this action—of whining, screaming jets slamming into the arresting gear, of clipped transmissions between air controllers and pilots, there stands a quiet figure, seemingly lost in the orderly confusion—the Landing Signal Officer. Is he the forgotten man of carrier aviation?

Before the days of high-speed, high-performance jet aircraft, the LSO was the key man in recovery operations aboard every carrier. From his platform on the fantail, braced against the wind to wave his colored paddles, the LSO was an extension of the pilots themselves. He was "Paddles," and he was the king of the fantail. Even the most casual observer could not miss the significant, colorful, contribution Paddles made to every landing.

Today the LSO is called Paddles out of tradition; he seldom uses them. Instead, he stands with the radio-telephone in one hand, the mirror light controls in the other. When a jet makes a proper recovery, the LSO gives no signal.

The LSO is forgotten, if general opinion has anything to do with it. An informal survey of pilots aboard one carrier in 1960 revealed that nearly every flyer considers the World War II LSO to have been far more important than his modern counterpart. Even some LSOs themselves agreed that, in their opinion, they contributed far less to the recovery operations of carrier aircraft today than they might have before the era of the angled deck, the mirror landing system, and the jet landing pattern. One LSO stated that he often felt useless—that he could do as much by remaining in the readyroom during recovery!

Why do some aviators feel this way? The majority of those with this point of view feel that modern innovations make a landing assistant unnecessary.

"The LSO," said one (an LSO himself), "is just a safety observer. If everything goes right, you don't need him. When something goes wrong, he might be able to help—if anybody listens to him."

Some pilots felt we should do away with the LSO entirely and label him "obsolete" along with other devices that have served their usefulness. Despite this prevalent opinion among junior officers, the LSO is still back there. Why?

The answer does not lie in a comparison of today's LSO with yesterday's. To evaluate him, we must consider his contributions from a positive viewpoint: what does he do for the supercarrier—not what he no longer does.

The opinion that he is merely a safety observer has some merits, or it would not be so widespread. It is true that when no mistakes are made, the LSO does little more than watch the proceedings. But how often does that occur? How often does that occur in any business? We must admit that errors will occur. And aside from the human life involved—which is by far the most important consideration—the cost of an accident today is 10 or 20 times the cost of an accident in 1946. That is common knowledge. But consider it along with the fact that today's aircraft is far more complex. The modern aircraft, in short, compounds small errors into heavy costs. The value of any safety observer—including a simple wheels watch—has increased. And as a result of many contributions,

by LT. William W. Mellette

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FORGOTTEN Man?

the carrier accident rate has been cut literally in half since the advent of jets.

Today's LSO, although practically motionless compared to his predecessor, could be contributing more to the safety operations than half a day's paddle-waving when he merely says: "Watch your lineup." This is not meant to disparage the LSO of yesterday, who deserves all the credit accorded him. But even he must admit the small difference between an "OK" pass and this:

> *. . . slightly high, followed by an excessive sink rate. Port main gear sheared on touchdown, followed by collapse of the nose wheel. Aircraft failed to engage arresting cable and continued up the flight deck until it became partially airborne before striking the water.*

Such tragedies have been prevented, you may be sure, by the simple statement, "You're high," made early. Think of the paper work alone that is saved by such a correction!

If the trouble isn't spotted early, what's wrong with the waveoff? If it could have been prevented earlier, and most of them can be, there's plenty wrong with it. During landing operations, an aircraft still airborne following a pass at the fantail is there because of an error. That statement should be law aboard carriers for several reasons. The principal reason is that other aircraft must land, and the time involved in a waveoff or bolter is responsible for so much more fuel being consumed.

The super-LSO, if he might be called that, must have a keen eye for trouble in the brewing stages. What kind of man does it take to catch errors in the making? There is no question about it: It requires an experienced aviator, a dedicated individual who takes his job seriously. There is no room for poor LSO's in today's Navy, and a good one

must command the respect of his contemporaries in all matters. The LSO, therefore, should be an outstanding naval officer and an outstanding aviator.

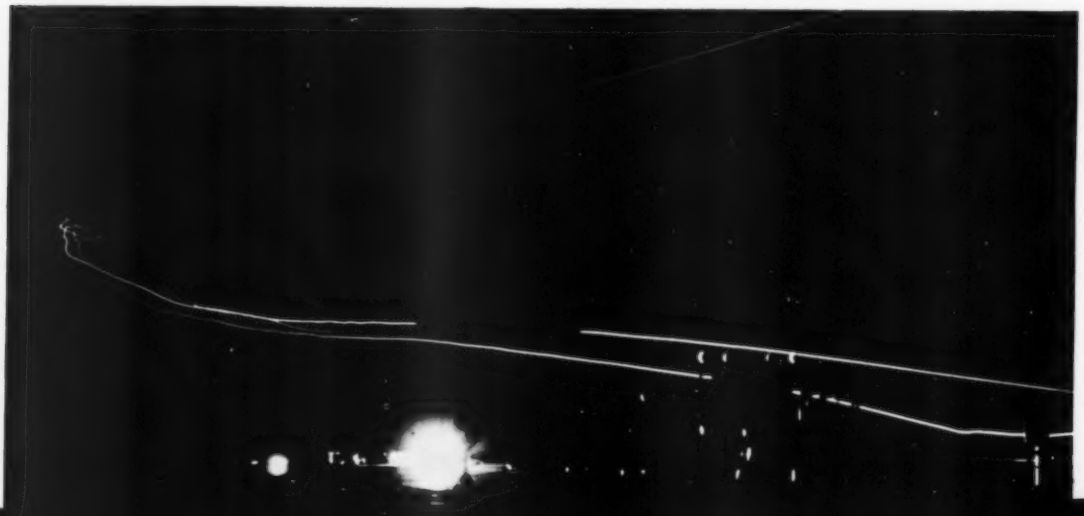
One contribution the LSO makes toward the safety of recovery operations is not noticeable except to those who have had occasion to benefit from it—assistance in flying the aircraft. The LSO should be experienced in all types of aircraft that he is qualified to "wave." In time of emergency, he can make on-the-spot recommendations to the pilot. His voice can instill confidence in a pilot under great strain of emergency—can save his life, in fact. This is another reason why the LSO must be an outstanding naval officer as well as an outstanding aviator. In an emergency, the pilot in distress will not listen to just anyone. He must have full confidence in his advisor's flying ability and in the basic integrity of the LSO. This is also important from the standpoint of the captain on the bridge and the air boss in the tower, too. In fact, the best way to evaluate the modern LSO is from high in the island, as though you had control of the whole show. Would you get rid of him?

Aside from the vital underway operations, the LSO plays another important role ashore, in the training of replacement pilots. Keeping in mind the *sine qua non* that small errors are greatly compounded by our new air machinery, we admit that an LSO must try to spot poor techniques before they develop into habit. The pilot must go to the fleet with a well-founded confidence in his own ability—a confidence directly dependent upon the confidence he feels in his LSO's ability—and integrity.

Although presently assigned to the commander of the air group, LSOs were formerly considered a part of the ship's company. Before that, they were part of the air group: It may change again. The fact is that he rightfully belongs to both groups: sometimes it is difficult to determine who he works for. For instance, in training pilots in field mirror landing practices ashore, is he working for the air group or the commanding officer of the carrier? On the fantail, is he working for the squadron breaking overhead, the air group, the air boss, or the skipper?

It really doesn't matter where he is technically assigned. Because if you are still ready to throw the LSO overboard, you will have to check first with several high-ranking men aboard the ship. From the indications at that level, chances are heavily against moving the LSO off the platform.

For those who refuse to give up the image of the old-time "Paddles" back there, it might be well to remember that the present-day LSO has paddles of his own that he keeps stashed away in a handy spot—and he knows how to use them. ●



Memory Aids

EVER try to make your own gouge for those emergency procedures? Even the finest memory in the world couldn't recall all the varied memory aids that have been tried through the centuries. . .

Memory jogs can be as complicated as the one devised by a 6th Century B. C. Greek named Simonides. He thought a woman could recall a grocery list by picturing the items stacked in a certain order around her bedroom or living room. Whenever she wanted to recall the items, she simply visualized the room and its contents!

A different use of groceries as memory aids was made by Laurenz Fries in 1523. "Partake of roast fowls, small birds or young hares for dinner, then apples or nuts for dessert," he wrote in a work entitled "How Memory Can be Wonderfully Strengthened."

Then there was the 16th century Italian professor who published a system which used "the most beautiful maidens his mind could conceive" as keys for for the items on a list of things to be memorized. Curiously, posterity has forgotten his name.

More valid are these memory improvement rules suggested by modern experts:

1. Be alert to what you want to learn—make a conscious effort.

2. Be sure you understand the meaning of what you want to remember.

3. Use your sight, movement and sound memory. To memorize words, for instance, look at them, say them aloud and listen.

4. Organize the material. It's easier to remember dates in a time sequence than dates that are mixed.

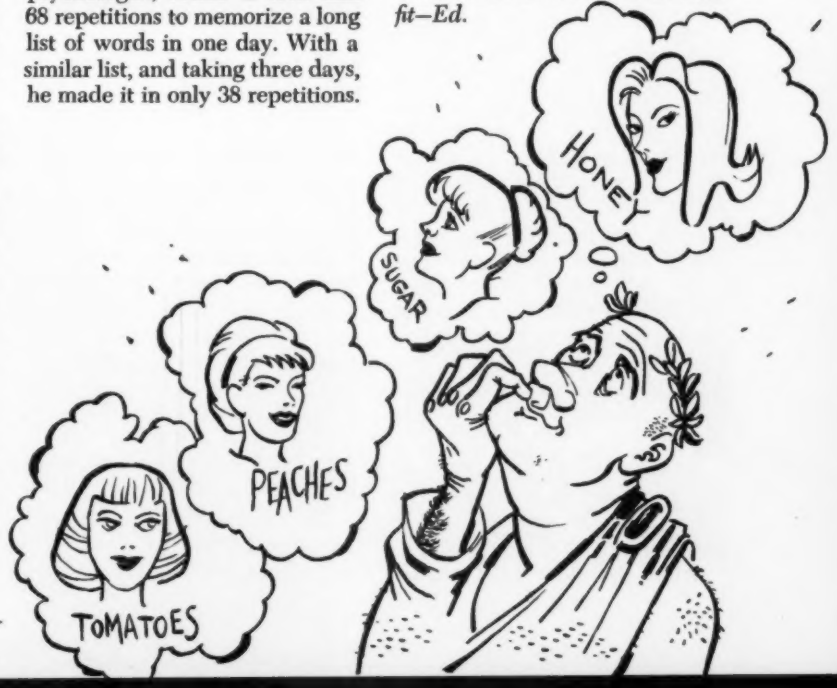
5. Use a trick to remember. A music student uses the phrase "Every good boy does fine" to remember the lines of the musical—E, G, B, D and F, from the first letters. Math students remember the number 3.14159 (pi) from the phrase "See I have a rhyme assisting"—the number of letters in each word.

6. Get yourself interested in what you want to remember. To remember people's names, for instance, get to know them well.

7. Spread out the memorizing. Hermann Ebbinghaus, a noted psychologist, found it took him 68 repetitions to memorize a long list of words in one day. With a similar list, and taking three days, he made it in only 38 repetitions. What's more, he remembered the second list longer.

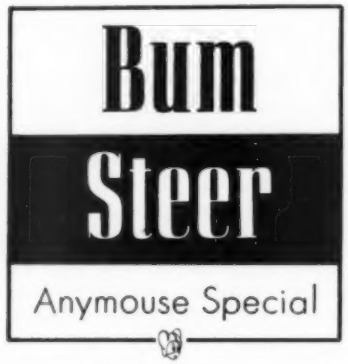
If, after all this, you still have trouble remembering things, take heart. Some things are bound to stick. Even an excellent memory has its quirks; the late columnist Franklin P. Adams could remember all the Latin he learned as a boy, yet forgot all the French he learned in his forties. Furthermore, a good memory is not necessarily a sign of intelligence; some very dim-witted people, called idiot savants, learn to memorize very well.

That's something to remember—next time you forget.—*Adapted from NAS Norfolk Training Bulletin. If you have developed a gimmick or limerick which makes any aviation memory task easier, please share it with* APPROACH—*so that all can benefit—Ed.*



Bum Steer

Anymouse Special



It was a beautiful day around Hawaii with only a few scattered clouds in the area. However, USS Boat wasn't so fortunate 600 miles at sea. There, we had a 700-foot overcast lowering 300 feet in rain showers. Tops were at 20 thousand.

The mission: Deliver a training shape on the ring target at Kahoolawe: receive 2000 pounds of fuel from a buddy tanker enroute to the target; fly wing on an A-3 (A3D) as far as Kahoolawe where he would drop me off in my trusty A-4C (A4D-2N) and I would deliver my shape. Another flight would follow me on target 10 minutes later and I would return home with them.

After hours of planning and briefing I decided it would be nothing more than a normal long range strike provided:

(1) the weather held at the ship,

(2) the weather held at the target,

(3) nothing unusual would happen on the way in or back out.

Launch and rendezvous went as scheduled. The A-3 (A3D), myself, and the tanker headed out on course climbing through layers of cloud. Following prebriefed signals, I set my tanker up for refueling as soon as I could handle the extra 2000 pounds. Upon plugging in, nothing. I backed out and tried again. Nothing. We tried again and for the third time nothing! Well, you can't fool with a bad tanker all day so I told him to go back home and send another tanker to meet me on my return leg.

I continued to the target, received a kiss-off from the A-3 (A3D) and he continued on to his target.

After the delivery I headed back for the ship, meantime contacting my return buddies and advising them of my heading and intentions of rendezvousing with a tanker on the way home. The radar monitor aircraft was in contact with my tanker and gave me a steer for fuel.

But, I thought to myself, this steer will take me way south of my desired track to the ship. Could I make it without the tanker? Yes, if I pickled my tanks, went to 40M, and made an idle descent to the ship. Too close, considering the bad weather factor at the ship . . . better take the steer to the tanker.

Wait a minute . . . how about Barber s Point? Plenty of fuel to try a rendezvous with the tanker and still make it to Barbers. And anyway I'm almost there, bearing 130° at 20 miles.

But all of a sudden there were two A-4's (A4D) on the air claiming low state and the need for tankers immediately. The monitor aircraft acknowledged and vectored both available tankers away from me! *My* tankers yet!

Oh well, still plenty of fuel for me. Let them go first.

One of the low-staters got all he needed from the tanker and drained him. The other took on a partial load from the other tanker and left enough for me.

"O.K." I said, "I've either got to get gas now or head for Barber's Point." The monitor aircraft rogered and cleared me in. In a few minutes he announced, "I hold you a merged plot."

"No joy."

"Roger, steer zero-seven-five." After a pause he added, "I hold you a merged plot."

Where in the #$%&( )°@ is that tanker. Check the gage—slightly above bingo—keep looking.

There. At 3 o'clock. I'm okay now. At least I had that feeling then.

I got ready, plugged in and . . . nothing. I backed out and tried again. And again nothing. Beginning to feel a depressed desperation, I checked my position with the monitor aircraft while the tanker recycled.

"Your Barber s Point pigeons, three-one zero, 250 miles," said the monitor.

Well, I'd let myself get steered and vectored right out of my bingo envelope. Now I either get fuel, or else. Did I have a bad probe? The tanker pilot gave me a thumbs-up for another try. I plugged in and, you guessed it, nothing.

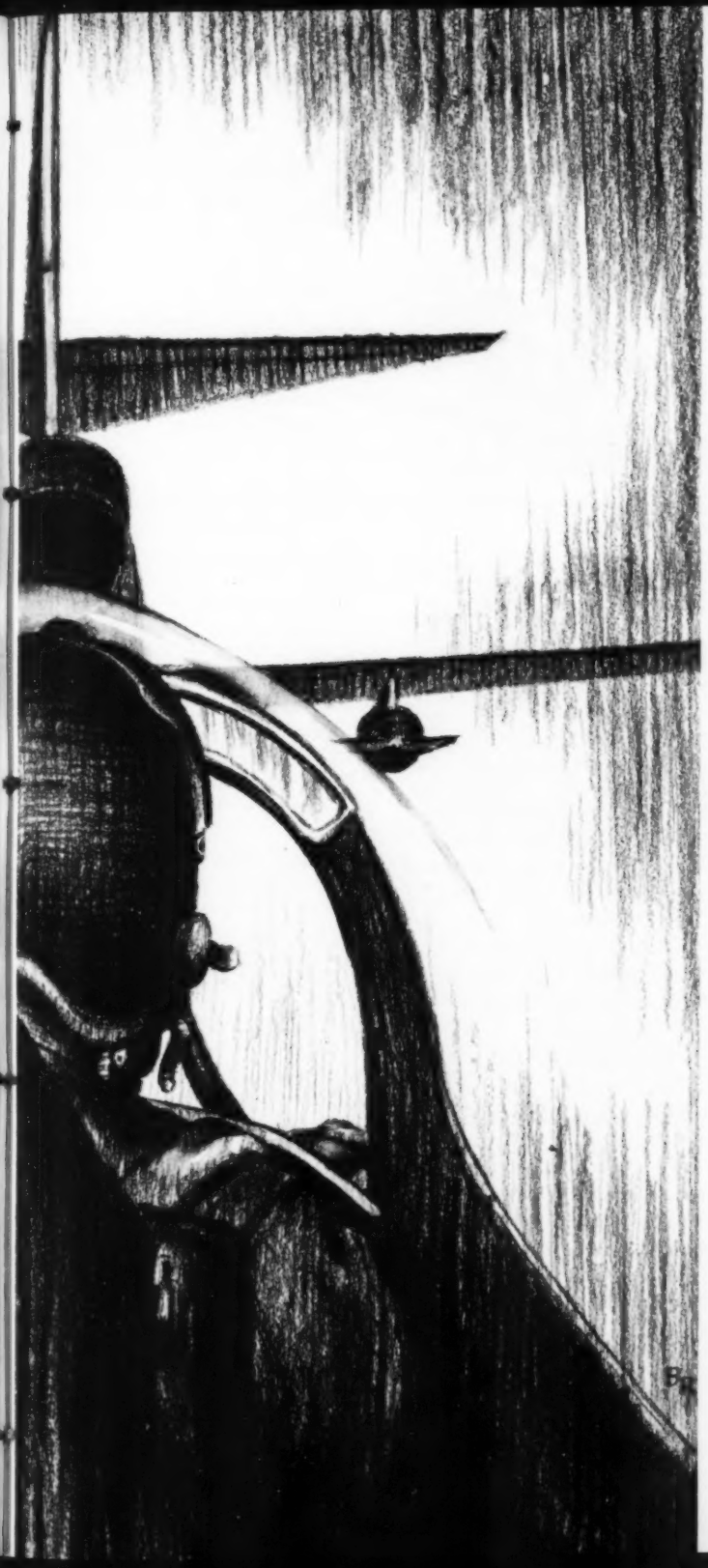
"Okay, what's my steer to home plate?"

"Zero-one-zero, 125 miles."

I couldn't believe it. Only 125 miles from the ship? They must have been running all out since I'd launched. I still had 1100 pounds and could make it!

Pickling the drop tanks I went to 40-thousand, called the ship and requested another tanker. They answered that one was already on his way. GoooD ShooW!

At 800 pounds I call the ship and declare a low state emer-



gency. They acknowledged with a "wait one." Five minutes later I couldn't even raise them so I shifted frequency and tried again. Again the reply, "wait one."

I glanced at the fuel gage and saw 500 pounds. "What is this," I thought, "where's the tanker? Why won't anyone talk to me? Don't they know what emergency means?"

Then, like the voice of an angel—"Hotshot, this is the tanker, over."

What a relief. But where is he? And just as important, where am I? Luckily I got a tacan lock-on. Let's see now, 185 miles from the ship on the two-two-zero degree radial, headed 30 degrees off course . . . wait a minute: 185 miles from the ship! Can that be right!? What happened to that middleman's 125 miles. I really got a bum steer.

When I passed this dope to the tanker he reported on the two-two-zero radial, 130 miles from the ship so there would only be a few minutes until interception. Then I thought, "Just how much of a chance do I have to save this bird?" My answer was to mentally review my life raft seamanship.

I started an idle descent from 40M to the tanker's altitude of 20M in hopes of meeting him just as I leveled off, also to reduce my fuel flow to a minimum.

At level off I got a visual lock-on and called, "stream the drogue, I have you." This better be good, it's my last plug-in of the day.

Easing in on the basket my last hope was that those other two stores were bad and that I really had a good probe.

I did have a good one! With 300 pounds indicated I plugged in and gaily watched the fuel gage rise and rise and rise.

Habit Pattern

IT STARTED with an old problem—a break in the habit pattern—but fortunately it only raised a little fuzz on the back of my neck.

I have a few thousand hours of wind machine time, including 1500 or so in the P-2. None of the P-2 time was recent, and on this bright sunny day, I was being requalled in a DP-2E by another pilot who had just started his 4th log book. We had a total of 29 years flying experience between us! I'd just landed for taxi-through on a bounce hop when an alert crewman in the afterstation noticed something dangling from the starboard flap (flaps fully extended). After completion of the pre-takeoff check list, for the umpteenth time, flaps were again placed in the full down position, while the crewman jumped out to investigate. It turned out to be a piece of gasket material, and of no particular consequence to this story, except that it set the stage.

The field was busy with a mirror bounce pattern in progress on the duty crosswind runway (only one available). As soon as the crewman was safely back aboard, we were cleared for immediate takeoff, since IFR departure traffic was stacking up behind us on the narrow turn up area. We eased into position, poured on the coal and went scooting into the blue – *MAIN-MOUNTS FIRST!* I was trying to make a normal takeoff, but as airspeed approached nose-wheel lift-off speed, the situation became progressively nose-low, even with full back yoke. About that time a little voice told me the flaps were still down full—and it wasn't the voice of my instructor. As the nose-up varicam came in we did a rather delicate balancing act, in a 90 degree crosswind, with the nose wheel the only one firmly on the ground.

Fortunately: (1) The pilot being fammed was old hand enough to know he had to fly it or lose it, and corrected his attitude with varicam, cleaning up in a gentle climb.

(2) The stable and sturdy old P-2 was forgiving enough to let him get away with it . . . this time.

The moral remains about the same: Don't let a break in the habit pattern or a tendency to rush get you into an uncomfortable situation; it could cancel your afternoon golf game.

Choked Up

An A-4B (A4D-2) was turning up for a late afternoon takeoff when the pilot noticed he could only attain 95 percent power. He taxied back to the line and shut down, whereupon it was discovered that an intake

ANYMOUSE

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in ready-rooms and line shacks. All reports are considered for appropriate action.

— REPORT AN INCIDENT, PREVENT AN ACCIDENT —

cover, minus the handle, had fallen into the intake.

You just can't hardly be a casual Anymouse anymore.

Beech Bang

While cruising under night instrument conditions over the island of Honshu a loud explosion was heard in the TC-45J (SNB). An immediate investigation revealed two engines running normally and the aircraft continued flying as advertised in the flight manual.

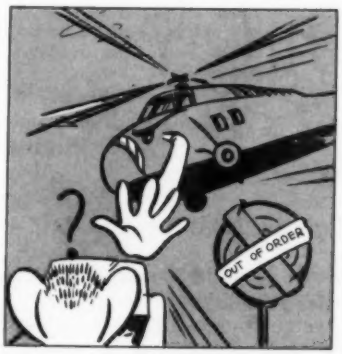
The copilot went aft with flashlight in hand, since there were no passengers on board. An inflight inspection disclosed no cause for the loud noise. A thorough search on deck, however, did reveal an exploded CO_2 cartridge and case in one of several mae wests on the cabin deck.

These life vests had been stowed in a neat pile on the starboard side next to the heater duct. Had the exploded CO_2 cartridge and case not been covered by other vests the explosion might have produced damage or injury to any passengers. The vests were so hot they could not be touched by bare hands.

Traffic Control

AT 0950 on 1 August 1963, I was driving on the street perpendicular to one of the runways on NAS—. At the point where the runway crosses the street, a system of flashing lights and sounding horns is set up to stop auto traffic. When I reached this point an SH-34 (HSS-1) was hovering over the water at my right about 30 to 40 feet above the water. I, and three other drivers ahead of me, slowed but proceeded. As the lead car crossed the intersection, the helo dropped and crossed the road to land. When the helo crossed the road, his altitude was no more than 10 feet and from my position his wheels appeared to be at car top level. *At no time during the helo's approach or landing was either a flashing light shown or horn sounded.*

This could have caused a terrible accident. Importance of using the warning system should be stressed to concerned personnel.



Cap Check

A section of A-1H (AD-6) aircraft was conducting a series of tail chase and acrobatic maneuvers. After recovering from a roll at approximately 240 knots, the wingman noted a whistling sound in the cockpit.

A quick check of the instruments revealed zero hydraulic pressure which was allowing the canopy to creep back slowly. The canopy lever was placed in the STOP position to prevent further creeping of the canopy and the flight leader was notified of the difficulty. The two aircraft then proceeded to home field (an east coast NAS) where a no-flap landing was effected using the EMERGENCY gear down system. Post-flight inspection revealed the cap from the hydraulic reservoir was lying in the bottom of the accessory section.

Since the aircraft had been airborne approximately 35 minutes before the cap worked loose (allowing the fluid to escape), it must be assumed that the cap was at least partially tightened. *This is one item that the pilot does not check on his preflight.* It is imperative that personnel conducting daily pre-flight inspections on the aircraft insure all items on the check-off list are in fact thoroughly checked.

This particular cap has no locking device or clamp and a visual inspection alone is not adequate.

There's the Rub

Pilot noticed fast rundown time on his A-4C (A4D-2N) and notified the plane captain. Plane captain informed power plant troubleshooters. Maintenance crew arrived at aircraft as another pilot was preflighting for next hop.

Visual inspection of turbine blades was called for and maintenance decided to send a man up the tailpipe even though it was hot from last hop.

When the turbine was rotated slowly a clicking noise was heard. The aircraft was downed and the tail section and exhaust duct removed. A heat shield retaining bolt had backed out and was rubbing the turbine. Cause was a faulty anchor nut when the bolt was installed, giving a false torque reading.

Lost: One hop and one bolt.

Saved: One pilot and one airplane. ●

Plight of the Flight Surgeon

Dear Headmouse:

In the Weekly Summary of 1-7 July, I noticed in a blurb from ComFAirCarib ComNabs 10 the statement about flight surgeons spending more time with their squadrons. As a flight surgeon there is nothing more that I would like to do. However, the Senior Medical Officers want us to spend more time at sick bay and taking care of dependents. There is a ComNavAirPacInst that states a flight surgeon should spend 50 percent of his time with his men. The SMOs and big honchos say that our time at the dispensary is the same as spending time with our men.

This is a fallacy! We can't even get to know the anxieties and peculiarities of our men in the time made available to us.

MEDICALMOUSE

►The instruction to which you refer is ComNavAirPacInst 13-01.3D. In para. 4b, it states, "In general, flight surgeons attached to shore based units shall spend at least 50 percent of their time with the unit to which they are basically assigned in their primary military medical specialty." This seems to be definite enough so misinterpretation can be weighed in the balance and found wanting. Perhaps your skipper would be willing to use this instruction to back his demands to the Senior Medical Officer for your services within the squadron. Talk it over with your commanding officer.

Very resp'y,

Headmouse

Shoot Seat Sense

Dear Headmouse:

"Shoot Seat Sense" July 1963 is a thoroughly commendable contribution towards improving ejection seat servicing, and is the type of article that should be read periodically, or better still before every periodic, by those connected with ejection seat maintenance.

I was glad to read of the emphasis that VMF-451 places on ejection seat training, as this aspect of training is not always performed adequately at squadron level. However, the reason for my letter is not only to congratulate the authors for their article, but to suggest to them that the Page 38 photograph would be better located on Page 37 under the caption "What's Wrong." The marine who is occupying the seat is holding the face curtain in quite an unsuitable, and in fact, quite a dangerous manner. I suspect his reason for doing this is to appear in the photograph, and I would have to begrudge him this chance of fame, as had he performed the action correctly, his face would be lost from view behind the face curtain. If our photogenic marine were to have ejected with curtain pulled at 45 degrees forward, air blast could easily have pulled it from his grasp, resulting in a possibility of drogue slug entanglement with the curtain, and also a danger of injuries to the arms or shoulders. Had he been able to hang on to the curtain throughout the ejection sequence, then the advantage of head and neck restraint afforded by the curtain during gun stroke and subsequent drogue extraction, would have been lost.

The action of pulling the curtain is one that requires periodic practice under supervision. The basic rules are simple: all that is required is for the occupant to grasp the handle firmly, keeping the forearms close together, and pull the handle OUTWARDS and then DOWNWARDS over the head. The elbows should be tucked well in to the body, and the curtain retained as close as possible to the chest during the ejection sequence; the curtain will be automatically released during parachute extraction. This is a procedure that all aircrews know, and yet how properly is it performed during training, or for that matter on ejection? I suspect that our unknown marine is in good company!

B. MACNAB
MARTIN BAKER AIRCRAFT CO. LTD.
Tech. Rep. to ComNavAirPac
March 1961-63
Higher Denham, Middlesex, England

►You're right in all respects concerning proper operation of a live seat. Headmouse suspects you are also right as to reasons for mugging the camera. Your points are well taken including

Have you a question? Send it to Headmouse, U.S. Naval Aviation Safety Center, Norfolk 11, Virginia. He'll do his best to help.

the nod to VMF-451 for putting ejection seat training and maintenance into proper perspective. It is hoped your letter brings the point home to prospective users and maintainers alike.

Very resp'y

Headmouse

For Reflective Tape

Dear Headmouse:

Many squadrons do not require their pilots to apply reflective tape to their protective helmets. They cite BACSEB 1-60 as stating application of the tape is recommended, not mandatory. In view of the fact that the reflective tape has on many occasions been instrumental in the rescue of downed airmen and is highly visible by day and night, I recommend that the BACSEB be revised to require all flying personnel to have the tape on their helmets.

ANYMOUSE

►Concur. Your recommendation has been forwarded to BuWeps.

Very resp'y,

Headmouse

Oxygen Mask Fittings

Dear Headmouse:

We have been receiving Sierra oxygen mask retention kits, Part No. 345-30 and Part No. 345-01 as a substitute for the Hardman 3740 series oxygen mask retention kits. So far, I have been unable to locate any official instructions setting forth the procedures for installation of the Sierra retention kit. Can we assume that we are to follow instructions set forth in BuWeps Aviator's Clothing and Survival Equipment Bulletin No. 17-58 and 17-58A?

Due to the fact that the bayonet of the Sierra fitting when installed in the Sierra latch assembly pivots 20 degrees, I feel that an individual fitting of a pilot may be omitted. The installation of the latch assembly may be standardized by aligning the horizontal center line of the latch outline of Figure (1) in BACSEB 17-58.

Also, I believe we would be getting an excellent latch assembly installation when utilizing the hole that accommodated the factory-installed chin strap, using this hole for the top front screw of the latch assembly. This hole is located 1⅝ inches below the visor track on the medium-size helmet and 1⅛ inches below the visor track on the large-size helmet which would, according to BACSEB 17-58, be out of tolerance by ⅜ inch and ¾ inch respectively which I would consider negligible.

The riggers at this command find your excellent magazine very informative.

ANYMOUSE

► The answer to all the points you have brought up is "Affirmative."

Very resp'y,

Headmouse

Ejection Seat and Rescue Helicopter

Dear Headmouse:

There has been some discussion locally on whether or not there can be a static surface or subsurface ejection from a floating crashed aircraft into the rotor blades of the rescue helicopter. Do you have any information on this subject?

ANYMOUSE

► The Naval Air Engineering Center has released the following information concerning the trajectory of ejection seats from aircraft that have crashed in the water.

If the pilot should eject with the aircraft floating on the surface, the seat will travel in an aft direction, 11 to 23 degrees from the aircraft vertical and will attain a height of approximately 60 feet. Although rocket-assisted ejection seats attain a greater height, the trajectory of the seat approximates that of the standard seat. The aircraft will remain afloat from 0 seconds up to a maximum time of about one minute depending upon the weight of the aircraft and the integrity of the airframe following contact with the water. Usually they will stay afloat for less than 30 seconds. There have been instances where the aircraft has floated for hours but these are extremely isolated cases.

As a general rule, if the canopy and cockpit are intact, the aircraft will sink in a tail-down attitude, throwing the ejection angle further aft. If the cockpit is flooded, the aircraft will sink in a level or slightly nose-down attitude. Sinking rates of aircraft will vary from about 2 fps to 12 fps depending upon the density and the integrity of the aircraft, particularly the cockpit area.

Once the aircraft has reached a depth of eight feet, which will occur in from ¾ of a second to 4 seconds, the seat if ejected will just about break the surface of the water, but will not attain any height in the air.

Based upon this information, it is possible to assume that the safest position for the helicopter to hover for the rescue operation is forward and slightly to one side of the cockpit. Once the plane starts sinking there is practically no danger to the hovering helicopter if the pilot should eject from underwater.

Very resp'y,

Headmouse

ELIMINATE THE HAZARD

"It was the biggest saber-toothed tiger I ever saw," said Oog, the cave man. "He sure came close to getting me this time!"

"How big a tiger was he?" asked Oona, his wife, putting more boiled leaves on Oog's scratched back.

"Here—I'll show you," the wounded man said. He picked up a charred stick and, using it as a pencil, he drew on the smooth wall of the cave a crude picture of the animal that had attacked him. "See? That's what he looked like!" he said.

"Wow! What a beast!" exclaimed Oog's wife. "But how come you weren't being more careful? You know this place is just lousy with tigers—how come you didn't see this one until he jumped you?"

"Because he was hiding behind that big tree down by the pool—that's how come I didn't see him," said Oog, clouting her across the ear. "How come you ask so many stupid questions, anyhow?"

Oona whimpered awhile and held some of the boiled leaf poultice to her bruised ear before replying. "I just thought that since you drew a picture of the tiger you could draw some trees and things around him to show how he was hiding, and then we could get the rest of the tribe in here for a meeting, and you could show them the picture, and then when any of them go down to the pool they'll be careful and look behind the trees to make sure there isn't a tiger hiding there, and then maybe nobody else will get clawed up like you did, Oog."

Oog clouted her again on the ear, spattering boiled leaves all over the cave. "You dopey dame," he roared, "what good is it going to do to draw pictures and have meetings and tell people to be more careful? Do you think that drawings and meetings will change that tiger into a pretty little pussy cat? What the hell does he care what we say about him? What we've got to do is to get a few of our best men and sharpen up our spears and go down there and eliminate the blankety-blank before he eats us all!"

Oog strode angrily back and forth, glaring at his wife and muttering to himself. "Meetings!" he snorted. "Reports! Warnings! Be more careful! It's getting so half the idiots in this tribe think that when you've got a tiger on the loose you don't have to do anything but talk about him for awhile and he'll go away. I'll tell you something, Oona," he said, "if we don't start drawing less pictures and killing more tigers, we're going to be fresh out of people!"

He sat down heavily. "I guess I shouldn't have clouted you, babe," he said. "Warning people is all right, as far as it goes. It's a good idea—but killing the tiger is a damn sight better one—and don't you ever forget it."—*American Airlines Maintenance Letter*

'I'm Not Tired'

Fatigue was a contributing factor in a carrier landing accident which occurred shortly before midnight during night carquals. The cause of the accident was a rolling slippery deck. Another contributing factor was the pilot's failure to reduce power.

The night before, the pilot had had only six hours of sleep. Fortified by a three-hour nap that afternoon, he had stayed up talking and snacking until 0200.

At 0800, readyroom personnel phoned for him to get out of bed and come on down – the launch had been moved up because of a change in flight schedule. (Breakfast is not mentioned in the accident accounts.)

This was to be a busy Monday for our pilot – his accident occurred on his fifth flight of the day. First, he completed a .3 hour flight with two day arrestments in preparation for night qualification. He had taxi troubles on this flight including a skid of 15 feet while clearing the no. 3 elevator. After flight, he ate lunch and spent the rest of the day in the ready room.

At 1625 he ate the early evening meal prior to manning aircraft 45 minutes later. At 1824 he was launched on his second flight of the day–0.2 hours and two arrestments. "Daisy-chained" to the hangar deck for refueling at the end of the flight, he sat in the aircraft for an hour and 10 minutes until his next launch at 1950.

The second night flight (his third flight of the day) lasted 0.4 hours. He made one arrestment. He then left the aircraft and returned to the ready room while the ship ran downwind for an hour. In the ready room after the flight was debriefed, the squadron commander and the operations duty officer asked the pilot about his physical condition and his evaluation of continuing this cycle. The pilot stated his condition was very good and that he believed none of the pilots would have any difficulty.

The investigating flight surgeon, however, in his medical officer's report is of a different opinion on the question of the pilot's fatigue.

"I discount the pilot's statement that he was not fatigued prior to his last hop. I feel he was considering his physical state and was not considering mental fatigue caused by the mental stresses of trying to get aboard under adverse conditions . . . In his eagerness to finish his carquals he might well have suppressed any feeling of fatigue. As a flight surgeon, I feel that after the tense moments of final approach and arrestment were over the effects of fatigue would be most likely to manifest themselves because at this point the alertness afforded by a tense approach and arrestment is gone."

Approximately 25 minutes after the debriefing, the squadron launched again. Our pilot made two arrestments before being bingoed to the beach with instructions to return to the ship as soon as possible. Once ashore, turn around was accomplished without delay. While waiting for a JP-5 gas truck, the pilot closed out his flight with operations and checked for messages from the ship. Evaluating his mental and physical condition, he decided to return to the ship for his final arrestment. He filed his flight plan, inspected his aircraft and returned to the carrier for his final night-landing . . .

He made a normal CCA to a foul deck wave-off. His next CCA was normal with a slight right to left arrestment accompanied by a deck roll to port. This developed into a slow skid toward his 10 o'clock position over the side . . . .

In quick succession there was a small jolt followed by a scraping sound and a large muffled bump, a tumbling sensation, silence . . . then a soft bump similar to an arrestment. The pilot reached for the canopy manual release handle with his left hand but instead pulled and disconnected his anti-G suit. Grabbing the canopy release handle with both hands, at or a split second before water entry, he unlocked the canopy. As he raised his head from "down around the instrument panel" he could see by moonlight that the canopy was

open 3 or 4 inches with water about 2 feet below. The aircraft was in a slight right side down attitude.

"With a sigh of relief," he recalls, "I shoved the canopy open with the help of bungee pressure and unfastened my rocket jet fittings. I had to reach under water to unfasten my oxygen-radio connection while sitting on the starboard canopy rail.* After disconnecting, I saw the water was up

*Primary means of escape after ditching is by pulling harness release lever and exiting aircraft with survival equipment.

to the canopy rail. I pushed out backward into the water, swam away from the aircraft, and inflated my life preserver. I saw the ship go by and heard the crash announcement on the flight deck."

A number of shipboard life rafts had been knocked into the water as the aircraft went over the side. The pilot swam over to the nearest raft but, unfamiliar with this type, he could not figure out how to board it. Holding on to the ladder lines, he tried unsuccessfully to locate his survival flares and pencil flare gun. He did not have a one-cell flashlight attached to his torso harness. His two-cell red lens flashlight which had been strapped to his left thigh had slipped down near his ankle and he assumed he had lost it. He took his whistle from his anti-G suit pocket and blew it. (*Although the combined water and air temperature was below 120°F., the pilot was not wearing an anti-exposure suit. Anti-exposure suits had been on order by the squadron for several months but his size was not available at the time of this operation.*)

Seeing the plane guard destroyer close by, the pilot decided not to expend any more energy trying to board the raft. The destroyer proceeded to the general area of the smoke light flares thrown from the carrier and was vectored to him solely by the blasts on his whistle. When he was in range of the ship's searchlights, the reflective tape on his helmet became visible to spotters on the deck.

Personnel aboard the destroyer threw several lines into the water. The pilot grasped some of them but they were jerked out of his hands due to the seas. He wrapped one line around his hand but lost his grip and his gloves in the process. At one time his helmet struck the ship.

"Rescue at the destroyer was difficult for me as I drifted to the bow and got tangled in lines from the ship and the raft," the pilot reports. "At one time I had to hold on to the destroyer bow to keep from going on the reverse side of the ship. Once, I came up beneath the raft after being pushed or knocked under water by the ship's bow, and had to hand walk from under it."

As the pilot was coming up from under the raft, the back of his helmet caught and was pulled off. With difficulty he untangled himself from the lines thrown to him by destroyer personnel and the line connecting the liferafts. Finally he was pulled aft by a deck-manned line to the cargo net below the starboard bridge wing. Two crewmen stationed at the water's edge assisted him up the net with the deck-manned line around his chest. The pilot had been in the water for 15 minutes.

The AAR had more to say on fatigue in this case: "The possibility that the pilot was fatigued at the time of the accident was investigated. He had had only 6 hours' sleep the night preceding the accident, had flown five flights the day of the accident, and had spent one hour and 10 minutes in the plane between his second and third flights. The remainder of the day when not flying was spent in the ready room.

"The conditions under which the pilot flew the above flights were less than optimum because of the rolling and pitching deck. This would tend to make these flights even more fatiguing.

"The pilot, after his third and fourth flights, attempted to evaluate himself as to fatigue and his ability to continue his night qualifications. He could have been better evaluated by another person, preferably a flight surgeon. In the pilot's evaluation of himself, he failed to take into account mental stresses involved in flights of this nature.

"His decision to undertake his fifth flight was influenced by the fact that he needed only one more arrestment to complete qualification. He probably minimized any feeling of fatigue which was present. If any effects of fatigue are to manifest themselves, they would most likely appear after arrestment when the special alertness necessary for the approach rapidly subsides."

* * *

AAR recommendations pertinent to survival were:

- That re-emphasis should be placed on the necessity for pilots' frequent inventory of their survival equipment.
- That re-emphasis should be placed on the recommended ditching procedures. Adherence to these procedures in the A4C(A4D-2N) will assure retention of the pilot's survival equipment.
- That re-emphasis be given to pilots' retention of the APH-5 helmet with high visibility reflective tape as it affords protection of the head and aids in visual sighting during rescue operations.
- That consideration be given to the outfitting of aircraft carriers with a simple, rapid means of providing flotation equipment to a downed pilot or man overboard.
- That a kapok rescue sling, similar to that used by helicopter be attached to rescue lines used during personnel recoveries at sea. ●

Full Pressure Suit Helmet and O_2 Supply

The pilot of an F4B (F4H-1) and his Radar Intercept Officer were launched from a CVA in midafternoon to practice for a demonstration formation flight of five. The flight was briefed for a flight of 1.3 hours duration to rendezvous at 10,000 feet overhead the CVA, then to proceed to station 10 miles astern of the ship at 4,000 feet.

About 20 minutes after launch, the flight flew by the ship in a close diamond formation at 600 feet, then proceeded to a circle 20 miles at 4,000 feet ahead of the ship to join other aircraft in the Air Group for a mass fly-by. Approximately 45 minutes after launch, due to rapidly deteriorating local weather conditions, instructions were given to stop the air show, conserve and stand by for control. The aircraft were given the signal for immediate landing in the normal landing order, *Phantoms* first. The flight broke and the lead aircraft was almost abeam in the landing configuration when the command was given to divert all aircraft to an Air Force Base 95 miles away.

The weather over the ship at this time was 500 feet overcast, 2 miles visibility with light rain. The ship had been overtaken by a rapidly moving squall line oriented NNE to SSW. The areas east and southeast of the ship were clear.

At the command to divert to the AFB, the flight leader turned southeast to rendezvous the flight in a clear area prior to penetrating the squall line on divert heading. No. 2 aircraft joined on the right wing of the flight leader. All aircraft in the flight had sufficient fuel to arrive at the AFB with a comfortable margin of fuel reserve.

The flight entered the squall line weather at about 10,000 feet in formation. Shortly thereafter, the flight leader directed the flight to take 10 degree divergent changes for separation. At about 22,000 feet the flight broke into a clear area and the flight leader observed the No. 2 aircraft about ¼ of a mile on the starboard side. No. 2 banked

about 30 degrees toward the flight as if to rejoin the flight, then entered another cloud layer. At about 27,000 feet, the flight broke into another clear area and the flight leader observed No. 2 about ¾ of a mile on the port side with a 30 degree divergent heading. The flight was then about 45 miles east of the AFB.

This was the last sighting of No. 2. The time was approximately 1717. About 1720 the following series of transmissions was heard on land/launch frequency aboard the CVA: "We've lost our pressurization, close your mask," "Close your mask, we're in a dive, a dive, close your mask," followed by "This is (garbled) Mayday, Mayday, Mayday, Mayday. . ."

A total of 78 aircraft were involved in the divert from the Task Group. By 2330 all other aircraft had been accounted for on deck except No. 2.

On the basis of the Maydays, SAR was activated and search continued through the night. The following day at 1205 a life raft was spotted by a Coast Guard U-16 (UF). Two crewmembers aboard the plane reported seeing the RIO in the life raft, waving. Between the initial sighting at 1205 and 1220, three rescue helicopters arrived at the scene, but the RIO had disappeared from the life raft and was not seen again. However, the long and unsuccessful attempt to rescue the RIO is another story. Let's get back to the pilot and give a few facts leading up to this fatal mishap. . .

Both the pilot and RIO were wearing the Mark IV full pressure suit.

The accident board offers the following conclusions: "Hypoxia cannot be proven the causal factor but seems a likely solution in view of the time intervals involved and because of the facts that the pilot never responded to calls by his RIO, and had the habit of opening his face plate and dumping cabin pressurization while flying in the landing pattern." (Investigation revealed that many members of this squadron had the same habit of flying with the face plate up while in the landing pattern.)

"Under the pressure of a late decision to clean up and conserve, then divert to the beach, coupled with the close attention required to fly in formation, it is conceivable that the pilot forgot to lower his face plate and/or repressurize the cockpit," the AAR continues. "Three minutes elapsed from the time his aircraft was last sighted at 21,000 feet by the flight leader to the time the first distress calls were heard from the aircraft. This is within the time limits required for a man to lose effective consciousness when within the 25,000 to 35,000 feet altitude range without oxygen. Another possibility is the accidental partial separation of the pilot's upper composite disconnect block from the seat, resulting in the loss of oxygen supply and communications to the pilot. One other possibility is that he may have put down his face plate but had forgotten to turn on the oxygen supply. He could breathe easily through the crack between the face plate seal and the "window," not realizing that his oxygen was actually not turned on.

"Additionally," the report states, "the pilot preferred to fly in the pattern with the face plate up because of annoying reflections encountered with it down. He preferred to dump cabin pressurization due to the excess cockpit noise present with it engaged. A phenomenon known as 'organ piping' peculiar to the F-4B (F4H-1) aircraft sometimes occurs at low altitudes with reduced power settings, presumed due to characteristics of air flow in the air conditioning/pressurization system. Dumping cockpit pressurization will eliminate this annoying noise. It is possible that the pilot dealt with such a problem in this fashion on the flight concerned."

The full pressure suit is not merely for protection of the wearer against the effects of explosive decompression as many believe. The suit is a multi-purpose flight suit that will meet the protective requirements demanded by man's physiological makeup. In meeting these requirements the military role of completion-of-the-mission above aircraft altitudes of 50,000 feet is satisfied.

Here are these physiological requirements and how the full pressure suit provides protection in flight:

- OXYGEN—By not allowing the suit pressure to go above an altitude of 35,000 feet (3.5 psia), the individual requires the use of 100% oxygen which is delivered to him by the helmet's regulator under only a slight amount of positive pressure relative to his suit's pressure. The beauty of this system is NO excessive positive pressure breathing.
- GAS EXPANSION—This problem during rapid or explosive decompressions above 50,000 feet can very easily lead to a fatal conclusion due to exceeding the tolerable internal gas expansion ratio of man. Again keeping the individual down

at 35,000 feet of altitude protects him from this danger.

- HIGH ALTITUDE EJECTION—In the event that ejection must be attempted at high altitudes protection is gained from cold ambient temperatures and windblast effects. Retention of the helmet and abrupt, wrenching movements derived from windblast effect under high "Q" ejections are attenuated, through the helmet restraint system of the full pressure suit.
- ANTI-EXPOSURE—When properly outfitted in the waffleweave underwear the user is afforded protection against cold ambient temperatures due to the dead air space between the inner layer of the full pressure suit and the surface of the skin. This protection compares favorably to anti-exposure suit protection but is certainly not as long in terms of duration of exposure.

Any one of these could be considered equally as important as another. Of course, the perfect working order of the FPS as a single unit, without failure of any part under any of the above circumstances is the only practical way of thinking of the suit.

Due to design limitations, it is impossible for the present service mini oxygen regulator to deliver sufficient oxygen pressurization at these altitudes. Additionally, the oxygen would be delivered under such pressure by the mini regulator (50,000 feet maximum would be 18 inches of water pressure) that the user would find this high pressure extremely difficult to overcome. The high pressure in the lungs would also squeeze down on the blood returning to the heart. Hence, the full pressure suit supplements the outside pressurization to 35,000 regardless of the flight cabin altitude. The suit then delivers oxygen at 1.5 inches of water pressure above the suit pressure of 3.5 PSI (35,000). At altitudes of 63,000 feet and above there are far more serious consequences. Without supplemental protection at altitudes of 63,000 and above, the reduced pressure is so extreme that the body liquids boil off. This results in almost instantaneous death to the individual.

FACE PLATE UP IS DANGEROUS

Flying in the full pressure suit with the helmet face plate up is dangerous.

If you fly with the plate up, you are not going to get any benefit from your oxygen even if it is turned ON. If the face plate is up and the oxygen ON, 100% oxygen is being delivered by the regulator *but* it is escaping out the open face plate.

Even with the face plate down, you can still have problems if you have not turned ON *both* your oxygen regulator and the oxygen ON/OFF valve on the control panel. Both these valves must be turned ON to seal the helmet face plate and deliver oxygen. If the oxygen is turned OFF at either the regulator or the control panel oxygen ON/OFF valve, then the face plate will *not* seal and you will be breathing ambient air. The oxygen percentage of the air at 30,000, 50,000 or 60,000 feet is the same as at sea level (21%), but the greater the altitude, the lower the partial pressure of the oxygen. If your cabin pressurization system is working efficiently, the pressurized ambient air may have enough oxygen to lure you for a short time into thinking you are getting sufficient oxygen but unconsciousness can, rapidly and without your suspecting it, wipe you out.

Design-wise it is possible to eliminate the regulator valve by locating a cut-on valve at the lower end of the helmet face plate seal. Lowering the face plate would trip the cut-on valve automatically turning the oxygen flow ON. The control panel ON/OFF valve, of course, must also be ON. This installation is presently in operation on the Mercury space suits and has been incorporated in the newly proposed full pressure suits.

Remember these simple precautions when flying with the full pressure suit:

- NEVER fly with the face plate lowered without turning on both the oxygen regulator and the control panel oxygen ON/OFF valve.
- Avoid flying with the face plate up. Never assume that because of low altitude flying you will not need oxygen pressure; you never can tell when the situation may dictate a zoom maneuver to high altitude.
- Learn to cope with reflection problems caused mainly by the large face plate "window." The inexperienced wearer focusses his vision on the face plate "glass" and not on the object he wishes to see. Focus your vision on infinity or on the object you want to see, not on the face plate "window."
- Avoid dumping cabin pressurization during flight. The problem of "organ piping" should be resolved with ASC-150 which incorporates new turbines in the F-4 aircraft. These new turbines should be available at supply points and squadrons. ●

GO, MAN, GO!

A plane with three persons aboard ditched and rolled right.

On impact the grey plastic visor on the pilot's helmet fell down over his eyes. He released his safety belt and immediately lost his orientation in the cockpit. Unable to locate the hatch jettison handle or any other exit the pilot felt some broken plexiglas which he worked on until he had a hole through which to exit. The crewman and a photographer in the cabin experienced serious difficulties but were able to exit eventually.

These were three lucky people. The photographer had someone to help him so his chances were good from the start. Both the pilot and the crewmember almost didn't make it. The story of what happened to them is a story that can be found in survivors' statements of almost any ditching where the plane sank immediately. Here is the way it usually happens:

The plane comes to rest. As soon as it stops, you unfasten your seat belt. You want to get out, and right now. You know the plane, you have been flying it for years, you are going to head for the nearest exit.

But what happens when you unfasten that belt? While all violent motion has stopped, the plane is still moving—around all three axes—as it sinks. When you unfasten the belt, you start to float away from the seat and you can now move around all three axes, but not necessarily in the same direction as the plane. It's dark (even without a helmet visor) and suddenly you are lost, lost in a relatively small cockpit, one that you know like the back of your hand. That window was just over to the right and slightly ahead, but which way is ahead and right? The plane might well be upside down in the water by now. At any rate, it is getting deeper by the second. You have *got* to get out of there.

Now starts a frantic groping in the dark. That familiar cockpit is no longer so familiar. If you are lucky, you grab something that you recognize and that helps to orient you. You move from the familiar object toward the exit that should be right over there. You can't travel as fast as you do in the air—your lungs are bursting—can that exit be this far away? Maybe that wasn't the old familiar object that you used to locate yourself, maybe you are going in the wrong direction?

Right about now panic strikes you. You are not making any progress and you have got to have some air.

With those who did not survive, we can only guess at what happened next. Did they give up the struggle? Some will under these circumstances. Others will thrash madly about with no purpose or plan and use up what little air they have left. Some were undoubtedly trapped or caught in the wreckage and could not get out regardless of effort.

With those who did survive, a few did panic momentarily but managed to locate an exit and escape. The great majority realized that their only hope was in planned, persistent, methodical work toward escape.

This general run of events can be found in jet ditchings where the cockpit is so small you would not believe you could get lost. It can be found in helicopter ditchings, transport ditchings, practically any ditching where the plane sank very rapidly.

Is there any way to prevent this?

Yes—not by doing one thing but by a combination of several things. Some of these are procedures you cannot practice. They are procedures that you will not be able to follow unless you prepare yourself now—and periodically refresh this preparation in your own mind.

First—you can realize that the problem of getting lost in a sinking plane is a real one. How do you prevent it? By making yourself sit in the seat with your belt fastened until you know where you want to go and how you are going and what you are going to do when you get there. That is a tough one—but if you have thought it out ahead of time and if you know and believe that this gives you the best chance, you can sit there a moment or two before releasing the belt. As long as that belt is fastened you know exactly where you are and can collect your thoughts and plan your move. Once you know exactly where to go, release that belt and go, man, go.

Second—you must know your plane. Sit right

where you are as you read this and test yourself. Imagine that you are in the seat you normally occupy in the plane. Can you put your hand out and touch the emergency release handle for your exit? Do you know which way it turns, or whether it pushes or pulls? Do you know this for every exit, not only the ones in the cockpit but those in the cabin? If you don't, you need some review. What about the rest of your crew? If you need review, they probably do too.

There are other lessons in this accident. The pilot's sliding window slammed shut because it was not latched open. It has a latch—use it. The pilot's sun visor slammed down over his eyes on impact. If you have a visor on your helmet, keep the visor mechanism in good condition and keep the visor latched at all times.

The Coast Guard boats in the area commented upon the ease with which they sighted the crash helmets worn by the survivors. Does your helmet conform to BACSEB 1-60 which recommends reflective tape?

A few days after this accident the command found an emergency release handle on the copilot's sliding window in a similar aircraft which would *not* release the window. All units have been directed to make an immediate one-time inspection of these release handles. In the meantime an investigation is under way to determine whether the fault was in an improperly manufactured handle or in the rigging of the cable into the handle.

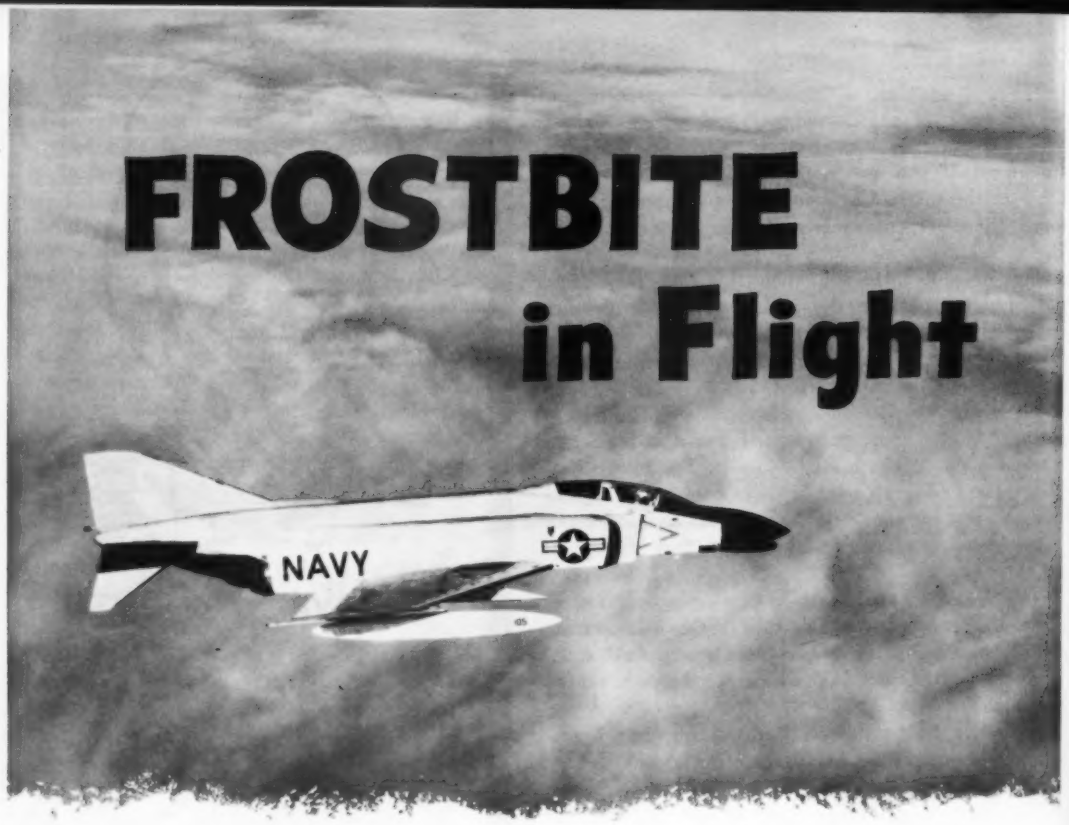
these were three lucky people

The location and operation of every piece of emergency equipment on your plane should be a basic part of your knowledge. It should never be allowed to become "dim" or "rusty."

This is another area where lack of practice slips up on you before you realize it. You learn where all these items are during training—but how long has it been since you reviewed your knowledge? Thirty feet under water—dark—cold—scared—this is a mighty poor time to start a search for a handle or to try and read the arrow showing which way it turns.

—Adapted from USCG Flight Safety Bulletin #7

FROSTBITE in Flight



BEFORE takeoff, the F4B (F4H) pilot knew his cockpit heating and air conditioning system was malfunctioning. However, he elected to fly the aircraft despite the known deficiency. Cockpit pressurization was normal. Both he and the RIO became very cold but due to the urgency of the flight they decided to continue. The duration of the flight was 2.4 hours. An altitude of approximately 35,000′ was maintained for fuel economy. In spite of the fact that the pilot was extremely cold all over he was somewhat euphoric. Although his left knee became very cold and numb, he failed to realize that it was "frozen."

The temperature was –20° C.; air was pouring in from the floor area around the pilot's and RIO's feet. The pilot could have stopped the flow of air by dumping his cockpit pressure; however, this would have dropped the cockpit temperature to the ambient temperature of approximately –50° C., as well as exposing both men to the possibility of dysbarism.

Both pilot and RIO were dressed in summer flight suits with cutaway anti-G suits outside.

Two factors are thought to explain why the pilot's left knee was frostbitten and his right was not: 1) his metal kneeboard worn on the left knee acted as a heat sink and 2) the position of this kneeboard caused it to act as a barrier to the air flow from the floor thus setting up eddies of cold air over the knee.

Upon arrival at NAS——, the pilot had difficulty making a normal approach. He descended to 5000′ and flew around for 15 minutes before he could land. On idle descent, the instrument panel fogged but the canopy did not. During descent the pilot was unable to activate his harness release handle because it was frozen.

The pilot reported that during the flight frost flakes were apparent on his eyebrows and eyelashes. He stated that the RIO put his baseball cap over the "eyeball air inlets" and prior to

landing, the cap was half full of frost.

After landing, the pilot reported to the dispensary. The dispensary entry in the health record reports blistering over the knee cap with dark bluish-black discoloration in the center. Two days later a large blister formed. Thirteen days after the incident the pilot was transferred to a naval hospital. At this time there was a well-defined area of gangrene about 2 cms. in diameter on his knee. The patient was later transferred to another naval hospital. On admission it was noted that he had a 4 to 5 cm. area of "proud flesh." This was repaired by plastic surgery.

The patient was hospitalized for two months. He was returned to duty two days after discharge from the hospital.

Undoubtedly, this pilot was anxious to fulfill his obligations.

However, his actions placed two lives in jeopardy, reduced combat capability and predisposed himself to temporarily disabling injury.

Aircraft cannot exceed certain design limitations – pilots too need to continually keep in mind that their bodies have design limitations.

Negative—Positive

A PILOT ejecting from an aircraft in uncontrolled maneuvers needs all the help an anti-G suit gives him in such an emergency.

An RF8A (F8U-1P) pilot, who ejected after generator failure, estimates he had three to four positive-Gs acting on him at the time. He was wearing a Z-3 cutaway anti-G suit. Thrown about sideways with his arms held down by positive G-forces, he had to grasp his right wrist with his left hand and push up on it to grab the right hand face curtain loop. He then moved his left hand up on his right hand to grasp the left loop.

When he finally was able to pull the face curtain, negative-G neutralized his first attempt. The curtain came part way out but the canopy did not blow. In spite of his shoulder harness, G-forces were pushing him down and to the right. Thinking, "I've waited too long," he pulled again. A sudden surge of positive forward G-force helped him, and the curtain came out from over his left shoulder down to the right across his face.

Ejection was successful.

Leather Jacket

A PILOT making a high speed ejection from an A-4B (A4D-2) parachuted down, apparently unconscious, into a farmer's field. He was dragged about 100 feet after landing.

The pilot was wearing his leather flight jacket over his torso harness, unzipped and back on his shoulders so it wouldn't cover the rocket fittings. Although the jacket stayed on until he touched down, the leather at the top of the right arm was torn. As the pilot was dragged along the ground after touchdown, the jacket was pulled off of him. He doesn't remember anything from the time he pulled the face curtain until he regained consciousness on the ground. A farm worker found him and assisted him until the rescue helo arrived.

An endorser of the AAR made the following comments: "BuWeps Aviation Clothing and Survival Equipment Bulletin 2-57A, paragraph 2(c) prescribes the procedures for wearing the torso harness. This bulletin states that the torso harness is to be worn as an 'outer garment' and discusses its wear with flight suits, anti-exposure suits and anti-G suits. Although no mention is made of wearing flight jackets, it is logical to conclude that they will be worn under the torso harness since it is to be the 'outer garment.'"

The Safety Center has received a report indicating that some pilots may be having their jackets altered with holes for the shoulder straps. This is *not* authorized. Wearing a flight jacket over the torso harness is a dangerous practice. Section H allowance list authorizes two torso harnesses. Suggest you draw one for summer and one for winter that can be worn comfortably over your flight jacket or your anti-exposure suit.

In the Dark

Pilot's recommendation after going over the side in an A4C (A4D2N) at night: That all naval aviators practice actual water survival at night without the aid of artificial lighting because of the difference in light conditions and the feel of wet and slippery survival equipment and the material used to attach such equipment.

Survival Gear

Item: The pilot in an accident released all of his survival gear on the assumption that helo pick-up was imminent.

Recommendation: Squadron safety officers should re-indoctrinate all flying personnel on the importance of retaining their survival gear. A seemingly "imminent" rescue could be delayed because of helo failure, weather change or other unforseeable factors.—*Safety Council Minutes*

Yellow equipment is vital in supporting flight operations — without it any modern aircraft weapons system is no go. Paralleling the vitalness of Mobile Unit Ground Support equipment is the need for qualified operators. To show the reasons why and to correct the situation here is what is being done in the field of

Tail-heavy Tow — Inexperience coupled with lack of supervision.

MUGS TRAINING

IMPROPER use of yellow equipment is costing millions of dollars every year in repair and replacement costs.

In addition to reduced mission-readiness, personal injuries and maintenance man-hours are going up and up. Reason enough for each of us, you and me, to take a second look at current preventive measures and to be on the look out all of the time for new ways to reduce this lecherous drain on our already short resources.

Contrary to popular thinking most damage to equipment occurs through negligence and minor rule infractions rather than through singular major offenses. A study of the problem has shown the major reasons for improper use of this equipment to be:

- Lack of effective training for the individuals

Mugs Foibles

by N. C. Bensene, AEC,
NAMTG, Memphis

In the interest of safety
We all need a laugh—
While MUGS gets battered plenty
Let's cut all crunches by half

Look at MUGS run—
He's fleet as a deer
'Course there's a reason—
He left his tow tractor in gear!

Forklifts unattended
With engine left running
Soon collide with parked aircraft
With a crunch quite stunning

MUGS can't be bothered
With such things as chocks
"Old equipment never dies—
It just rolls away in flocks!"

Near the end of the day
And everything still goes wrong
The overload on MUGS' forklift
Couldn't be budged by King Kong!

Correct operational procedures
MUGS seems to forget—
He maneuvers the NC-5
While still plugged into a jet!

MUGS has done it again
And we share his grief—
His crash crane dropped the plane
On the leading chief!

MUGS drives too fast,
And we have a hunch
His NC-5 is headed for
The inevitable crunch!

An exploding air compressor
Causes MUGS to become airborne
Incorrect operator procedure
Makes safety officers blow the horn!

Unauthorized Use — Unqualified driver.

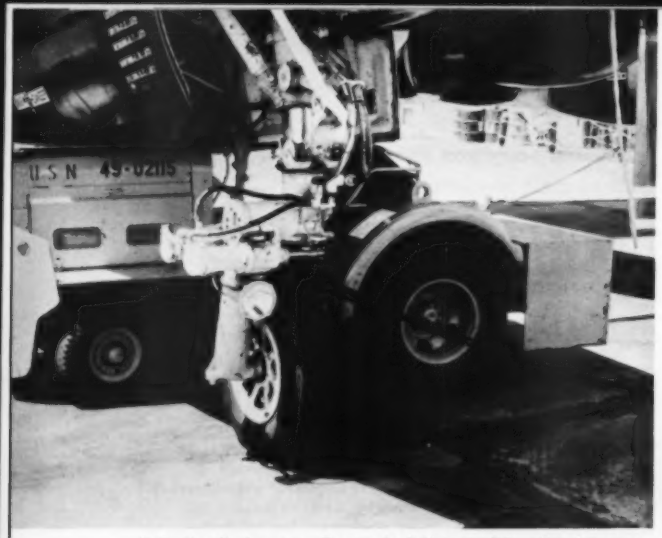
who operate and maintain the equipment, and

• Lack of effective supervision and leadership by the officers and petty officers directly responsible for such operation and maintenance. In other words, this problem area has been sadly neglected.

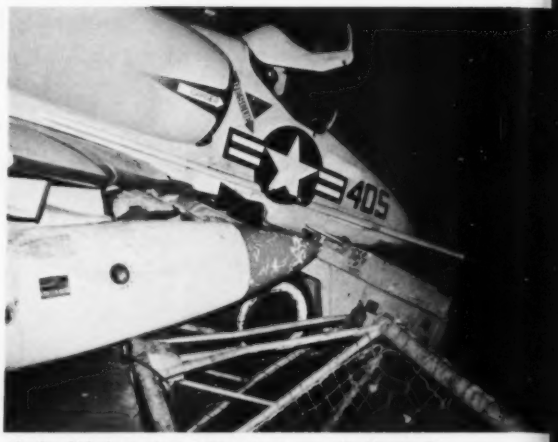
Training

Here's a fertile area in which we can save lives, equipment and work. Realizing this the Chief of Naval Operations established a training program with the publishing of OpNav Instruction 3500-.26A of July 1963. The Naval Air Maintenance Group headquartered at Memphis was assigned the task of providing standardized training. The program is now getting underway.

To fill this need five new NAMT detachments



Defective Equipment — Tractor had history of jumping into gear.



Brake Riderless — Tow attempt at sea — foolhardy biz.

joined the two already in operation at NAS North Island, San Diego and NAS Norfolk. The new detachments are located at NAS Quonset Point and NAS Jacksonville on the east coast; west coast detachments at NAS Alameda and NAS Barbers Point. NAS Pensacola houses the detachment to serve the needs of the central portion of the U. S. and of the Training Command.

To assist in setting up the new standardized program, NAMTG has developed a training package for use in training Aviation Support Equipment people. Training packages include three kits:

No. 1, an Instructor's Manual and transparencies suitable for use with a standard overhead projector to teach proper use of Mobile Electric Power Plants:

No. 2, necessary material for teaching operation of Portable Hydraulic Test Stands, Air Compressors and Liquid Oxygen Servicing Trailers: and

No. 3, material applicable to Fork Lifts, Tow Tractors and Crash Cranes.

These Aviation Support Equipment Detachments will provide training to personnel of the AE, AMH, AME, and ABH ratings who have been selected by their ships and stations to be local ASE instructors. Upon completion of a two-week course of instruction, the ASE detachments will provide a Training Package to the prospective local instructors which will be forwarded to their home command. By training individual personnel of supporting activities to utilize the training packets and to conduct instruction in their own commands, *a standardized operator training*

Too Short — Short cable and short on experience.

Unattended Tractor — Motor running.

program will be locally established at all ships and stations throughout the fleet.

The work of the ASE program will not be complete with the distribution of the initial packages. New equipment is being constantly developed and delivered to the fleet, as well as a wide variety of additional equipment not covered by the original training packages. A team of technical writers has been established at NAMTG Headquarters to prepare new training kits, and it is anticipated that additional kits will be forthcoming by the time full distribution has been effected for the first phase of ASE training.

NAMTG is maintaining close liaison with ComNavAirLant and ComNavAirPac, as well as with other type commanders in the establishment of schedules and priorities for training. Class schedules, quotas, and all necessary information to speed ASE training on its way will be given wide distribution as soon as they have been firmed.

Coaching MUGS

Much can be read in safety literature and in the daily press about the skill and care of the professional driver on the highway. If we, in naval aviation, are not developing, encouraging and demanding the same skill and care by our people who operate tow units, cargo vehicles, fork lifts and fueling equipment, we are remiss in not taking advantage of an area in which immense savings can be made in preventing human suffering, equipment damage, and delayed operations.

"Pro-D," the professional driver's newsletter, published by American Fore Loyalty Group Insurance Companies, recently featured a salute to "Knights Of The Highway." It is reprinted below. If our readers read "Airport" into the article in place of "highway" or "road," this could well apply to the airport vehicle operator, too, who is well trained and supervised, and who is fully aware of his responsibility to his fellow workers, his employer and the public.

A Clean Record is Better than a Good Alibi

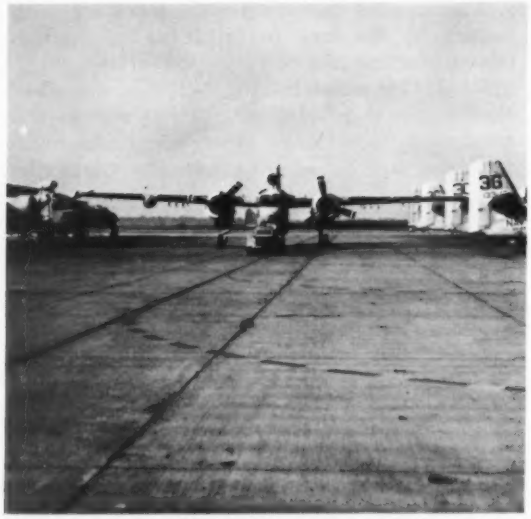
The highway safety council record of the professional driver is far better than that of the non-professional. This is because driving is the business of the professional; the highway is his workshop. He is not only familiar with the rules of the road, but he has also learned to be patient with and tolerant of his foolish and less skilled fellow users of the highway; he has learned to be alert and to expect the unexpected and, most of all, he has learned that failure to apply all of his skill all of the time will sooner or later lead to an accident.

In a few minutes time, a moron can be taught to speed, to cut corners, to zig-zag, to buck traffic, to scatter pedestrians. Yet the ignorant and foolhardy believe these things to be evidences of skill.

It takes many years to ripen and experience a truly skillful driver. His operation of a vehicle is a thing of beauty, of velvet smoothness and majestic grace. He lets the fool rush in, yet spares his life; he suffers the pedestrian to pass before him and his practiced eye and alert mind are ever ready for the eventuality he knows will challenge him.

The professional driver has this reputation to uphold, that he will go further than ordinary care, and will permit not even the other fellow's recklessness to tarnish the shield of the Knights of the Highway.

—Adapted from NSC "Newsletter"



SIGNS OF THE TIMES—Stoof with wings spread towed between two rows of aircrafts resulted in two aircraft receiving crunches. Involved in the movement were four apprentice airmen manning stations of tractor driver, brake rider and wing walkers. An Airman, senior man present was tail walker.

Trouble Topside — Forklift adds dimension to driving.

All aviation activities may obtain further information relative to ASE training by contacting the nearest NAMTG representative in their area.

Supervision

Concerning supervision, the final responsibility for the safety of personnel and effectiveness of equipment is vested in commanding officers. No amount of training can substitute or compensate for deficiencies in this particular area. But, with proper supervision, from the top down and the bottom up, and thorough attention to details of the program, gains are bound to be made.

Strict control of qualifications, licensing and revocation of same where necessary appear to be the key factors in effective supervision. Skippers, officers and petty officers are urged to familiarize themselves with OpNav Instruction 3500.26A.

In short, by providing sufficient training and properly supervising this program we can reduce substantially the number of personal injuries, damage and the resulting dollar losses.

Pulled Plug — NC driver was unqualified — disqualified chopper.

Workmanship and Pride

By LT Chips Cohan
AMD Norfolk

These two words are very closely related in aircraft maintenance and should be in the mind of every Navy man.

Inspecting completed work, and observing personnel seems to indicate that like the symbolic American Eagle, these traits are rapidly becoming extinct. Repair work is completed with an attitude of—Hurry up!!!—SO what, it works doesn't it!!—etc. The end result is disastrous in that the trainees pick up this feeling from the Petty Officers, and with each new group, the degenerate effect is more pronounced and accepted as standard procedure. Quality of workmanship and confidence in repairs suffer accordingly.

There is no question in my mind that this is basically the fault of leading supervisory personnel who accept and condone mediocre or poor work, and would rather allow it than become unpopular by demanding quality results.

In a great many instances it has been discovered that the personnel assigned to do the work are not qualified, or do not know how to perform the job. Yet — the practical factor sheet has been signed off to show these men have been examined and found qualified by some other person who supposedly checked to insure these abilities. Here is the first real tangible step in the breaking down of the individual's respect for knowledge and ability. He is given a cursory verbal test, or no test at all, and gets his practical factors signed off—even though he and the supervisor both know that he is not qualified in all the requirements.

In addition to this, he is then recommended for advancement although he may have been reprimanded for poor or unsatisfactory work, lack of interest, failure to comply with orders or to study etc., and is definitely not ready to become a petty officer and leader. He is recommended and advanced because—"everyone is letting the men go up now and it would be a cause of bitterness if I don't let him go up." After all he is as well qualified as some of the others being recommended—and so, the deterioration of respect and pride is further aided.

A review of practical factors, and a few well worded questions on some of the items included therein may reveal some very startling facts to the division officer, or the petty officer in charge as to how well qualified and capable his crew is.

With the ever-increasing complexities of modern aircraft, there can be no tolerance for the trend toward poor workmanship and lack of individual pride. This condition must be reversed to bring out the inner glow of satisfaction in a job well done and the reinstating of the feeling of personal pride and confident attitude of *each* workman in *his* work.

Artists All

ONE of the reasons an aviation mechanic is so interesting to himself and to others, one of the reasons he is so important to everyone within his orbit, is that he is an artist. Do not deny or resist that statement. It is true.

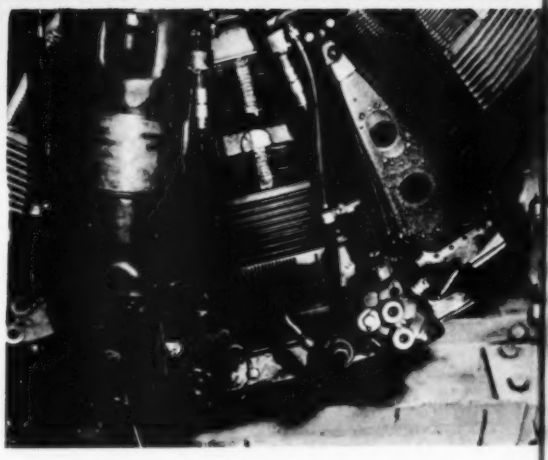
It is not necessary for a man to be a painter, a sculptor or a musician to be an artist. Every true mechanic is an artist. It is a matter of doing things well, in the very best possible way, and of finding the satisfaction and the happiness in the work itself, not outside it. Being an artist is not an outside, extra thing.

Rembrandt was a man of great understanding. He had the power of seeing deep into the significance of things. He had that power, that capacity, in abundance and so was a genius. But every good mechanic has that same capacity to a degree. Watch him troubleshoot a malfunctioning electrical system.

Rembrandt was never a quibbling or uncertain man. Even early in his experience his work evidenced a positive nature occupied in great enjoyment. That too, is typical of the mechanic, knowledgeable, confident, forceful, fully alive, up to his elbows in the thing he likes.

Small wonder it is so interesting, so exciting to live in the environment of fine mechanics—artists all.

—*Aviation Mechanics Bulletin*



History of oil leaks in the area of No. 6 cylinder, right, went unheeded. Crash above was the result.

Ground Checked Okay

ON THE last previous hop the R-1820 powered helicopter was downed. The reason for this was that immediately after takeoff the pilot was notified by the tower that he was trailing smoke. The chopper was landed immediately and a verbal report of the discrepancy made. It was also listed on the yellow sheet as "excessive engine oil leak."

Postflight inspection revealed a considerable amount of oil on the lower cylinders and the exhaust collector ring. After a wipe down and turn-up for 10 to 15 minutes the aircraft was released for flight. Engine failure causing a forced landing followed 40 minutes of flight. Substantial damage was received by the chopper during landing in the boonies. No injuries to pilots or crewman.

Investigation revealed an engine failure caused by separation of No. 6 cylinder at a point about 4 inches above the cylinder flange. Review of yellow sheets for the previous 14 days showed a history of oil leaks in the area of this cylinder. Six times oil leaks were reported. Six times wipe-downs followed by turn-ups on the ground failed to reveal the leaks. It was determined that the crack expanded due to high internal pressure on the cylinder encountered only during flight.

The accident board attributed the accident to material failure. Reviewing authorities made the following comment: It is not understood how an

excessive oil leak could be corrected with no more action than wiping down the engine. Suspicions should have been aroused and further investigation made, including a test flight. Because the aircraft was released for a regular mission indicating corrective action had been taken, *maintenance personnel error* was assigned a contributing factor.

Servicing Landing Gear

CHECK your servicing procedures for landing gear. Records indicate that units which are meticulous in their servicing procedures have the lowest landing gear failure rate. Is there a more convincing argument?

Recently O&R was requested to keep a record of the servicing of all F-8 (F8U) landing gear at PAR induction. This was accomplished by taking the strut air pressure reading, with the aircraft on jacks, soon after arrival. On disassembly the fluid in each strut was measured. The air pressure was critical in 20% of the readings taken and the fluid level was critical in 35% of the measurements taken.

Tools Are Safety Devices, Too

MANY mechanics never stop to think that the most important safety device a man can have is a good set of tools. Damaged tools, dull tools, broken tools can cause as much injury as the more noticeable safety hazards.

An important part of the toolroom keeper's job is the repair and maintenance of safety equipment and knowing the type of equipment to issue. For instance, there are several types of respirators for the various types of fumes and irritating substances and the toolroom man must know what kind of work the mechanic does in order to issue the right type of equipment.

The toolroom man should always inspect each tool carefully before he issues it in order to catch any safety hazards. Mechanics can help him by immediately returning any equipment which becomes broken, dull, or damaged so that it can be repaired.

While the toolroom man can be certain that the tool he issues is in good condition, the person receiving the tool has the responsibility to see that he uses it correctly and uses the right tool for the job—or all safety precautions go by the board.

A smart mechanic does not use a light tool for a heavy job or a heavy tool for a light job; or a straight screwdriver for a Phillips screw; or a file for a drift pin or a pry; or pliers for almost any kind of wrench; or almost any kind of a tool for a hammer.

Using the wrong tool not only makes the job harder, but it will probably damage the tool. Screwdrivers get bent and chewed and dulled. Screw slots lose their edges, wrench fittings get worn round, and wrenches get sprung or broken.

It is often said that you can tell a mechanic by his tools. Mechanics should always be certain that the tools they receive are in good condition when they are issued. It's up to them to keep the tools in good condition while they are being used and to use them correctly—not to misuse them.—*Adapted from the "Safety Review"*

From an AAR:

"The 3/8" wrench found at the scene of the accident cannot be discounted in theorizing the cause of this accident. Maintenance personnel must be required to take an accurate inventory of tools prior to and after work has been performed on an aircraft for statistics prove that adrift tools have caused similar accidents."—*ComNavAirPac*

Do Unto Others . . .

During the acceptance check of a C-1A (TF) delivered to a carrier, 12 outstanding discrepancies were noted indicating the aircraft was unsafe for flight. These discrepancies are listed below for information:

1. Port trim tab had an excessive amount of play permitting it to be moved manually to either extreme position from neutral. This was noted on a previous flight and corrective action was written as, "It should be changed."

2. Port engine primary oil separator outlet line installed improperly. It had been cross-threaded and forced on the first two threads causing one of the oil leaks in the accessory section.

3. Port engine breather tube from fire wall to overload dump had a series of holes permitting oil to spray into the accessory section.

4. Port engine exhaust stacks had to be replaced because of excessive blow-by on all slip joints. Number 2 exhaust stack adapter retaining bolt was broken and this stack was loose. Paint on the cowling was blistered. A previous pilot had noted the fire detection light came on at 45 inches manifold pressure. NAS Norfolk transient line

changed No. 1 cylinder stack and this corrected the fire detection light discrepancy. The probability of fire was great due to the combination of loose stacks and oil leaks.

5. Port engine front sump chip detector cannon plug was broken making the system inoperative.

6. Port brake assembly was worn below minimum allowance of 7/32". Brake shoes measured at 5/32".

7. Port nacelle life raft door would not close flush with life raft installed. Protruding ½" from nacelle (the aircraft was ferried with the life raft compartment empty).

8. Starboard engine magneto ground lead was not connected.

9. Starboard engine cannon plug on fire warning light was not connected making the detection system inoperative.

10. Vacuum pump engine seal was leaking excessively causing another oil leak.

11. Tailhook through holes had no cotter pins installed.

12. Small puncture to fuselage on aft starboard side adjacent to towbar attaching rings.

The following is a list of items missing at inventory:

Item No.	*Nomenclature*	*Shortage*
A-1	Adapter Compass	1
B-3	Canteen—water	2
B-20	Control Unit (ARN-6)	1
B-33	First Aid Kit	1
B-35	Signal Lamp	1
C-24	Pistol Pyrotechnic	1
F-2	Cargo Rings	12
F-3	Cargo Straps	12
F-4	Cargo Tie Downs	1
F-7	Kit A/C Files Cloth	1

None of these items are recent losses. All have been missing the past three inventories.

This information was submitted in the interest of improved maintenance procedures and safety of flight.

Yellowshirt, Good Show

AS WE were approaching the no. 3 catapult, prior to launch, one of the yellowshirts gave a cut signal for the starboard engine of our A-3 (A3D). The engine was secured and was followed approximately 30 seconds later by a call on land/launch of, "606, a rag just blew in your starboard engine."

Investigators found no damage. The rag turned out to be a blue neckerchief.

The vigilance of the yellowshirt and his quick signal possibly saved an engine. Engine failures on cat shots have been known to have serious or fatal consequences so maybe he saved a plane and crew.

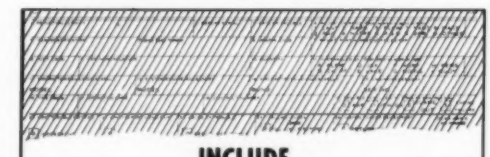
FOD Reporting

This FUR example lists the specific type information that is required from operating activities when reporting Foreign Object Damage (FOD). Such data will permit a more thorough analysis of the factors associated with FOD to gas turbine engines, and will aid in developing preventive measures to reduce the incidence of FOD in the future.

FUR *Example!*

WHEN REPORTING----

FOREIGN OBJECT DAMAGE

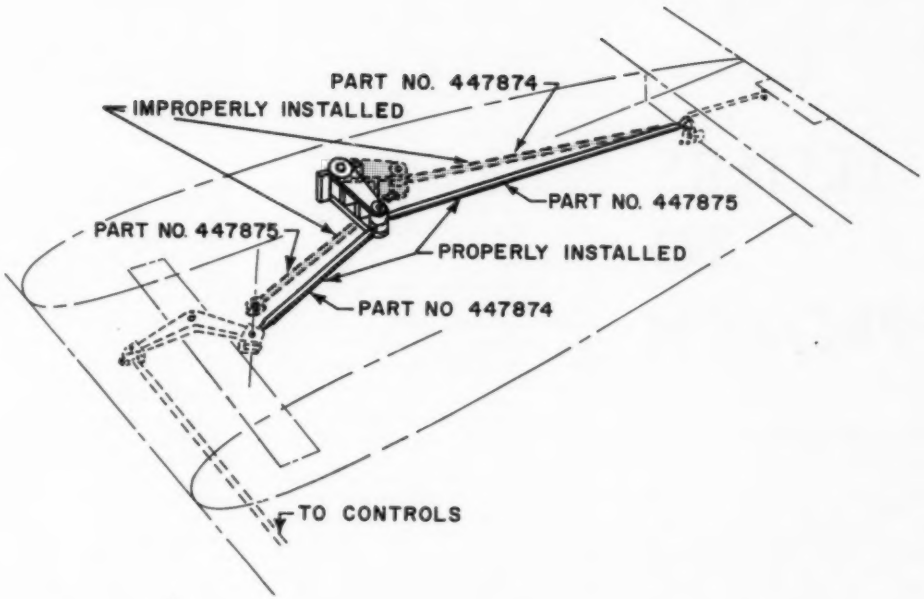


When reporting foreign object damage include amplifying remarks:

- **Specific engine section damage, i.e., compressor, turbine, etc.**
- **Any known information concerning the identity of ingested items and the circumstances involved.**
- **Any known FOD hazard conditions encountered and any corrective action taken or recommended.**
- **How and when damage was discovered, i.e., preflight, daily or calendar inspection, troubleshooting, etc.**

—NATSF

MURPHY'S LAW*



AFTER the preflight of a SPO2H (P2V-7) the pilot reported a possible aileron bind. The yoke could not be turned completely through, falling short by approximately 15 degrees of arc. When a check was made for the proper alignment of bellcranks and idler cranks in the starboard aileron system, it was found that Murphy had struck again. The outboard push rods, 447874 and 447875 were found to be *reversed* in their positions.

As the rods were unequal in length their reversal resulted in a displacement of the idler crank, wing station 441.5, common to both. This displacement shortened the resultant travel of the aft push rod on down throw aileron and also would have allowed the idler crank to butt up against a rib had the aileron down stop not been set incorrectly to restrict its travel.

There seems to have been several conditions that aided in this Murphy installation:

1. The push rods in question had no visible part number inscribed on them.

2. The lengths of the push rods are not given in either the HMI or IPB.

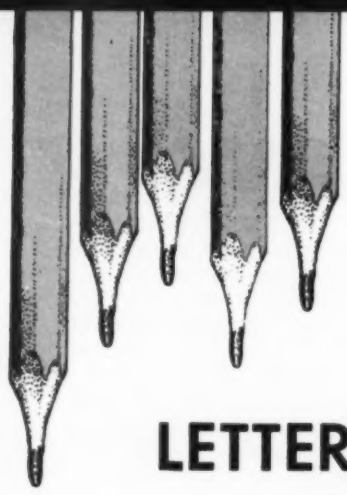
3. In this condition of reversed push rods, with controls locked in neutral, the aileron can be faired with minor adjustments to the length of the push rods giving the appearance of a normal system, even though the said bellcrank is out of rig.

It is recommended that part numbers be permanently inscribed where there exists the slightest chance of a part reversal. Also, if the lengths of these rods were to be given in the HMI or IPB it would aid in the control of proper installation. Knowing the "Murphy" could not have slipped by had the system been properly rigged, it is once more reminded that there is no substitute for proper procedures.

Contributed by LTJG J. B. Woolsey, VP-1.

Reference VP-1 FUR Serial 477

* If an aircraft part can be installed incorrectly, someone will install it that way!



LETTERS TO APPROACH

Meatball Doughnut Not Enough

FPO, New York, New York—The short article in the July APPROACH entitled "Meatball Doughnut NOT Enough" is so perplexing that clarification seems required. A very brief discussion of an F-8C (F8U-2) ramp strike was followed by a statement, presumably by the accident board, encouraging pilots to use the cockpit angle of attack indicator and RPM indicator. The statement is not further amplified but since the article concerned a ramp strike and also mentioned the requirement for noting trends away from the optimum, the reader is left with a presumption that the pilot can help avoid a ramp accident by making more extensive use of those instruments.

Insofar as it is extremely prudent to use the cockpit angle of attack indicator in making a comparison of airspeed and angle of attack when at approach speed, fuel, and configuration prior to every carrier pass, there can hardly be argument. If the pilot also wants to note RPM required, that's all right too if only because he may learn therefrom that his landing checklist is not as complete as he thought.

However, please, let's not recommend that pilots attempt to make a trend analysis of those instruments when on the glide slope. Such a practice would undoubtedly result in a marked increase rather than decrease in ramp strikes. If the angle of attack cross-check has been completed without discrepancy, a well-trained, reasonably skilled pilot of an F-8C (F8U-2) or any other carrier aircraft has sufficient information readily at hand to make not only a safe but a good night approach under favorable conditions. (Maintaining the training is quite another thing.) However, in the face of unfavorable wind, weather, burble, or with aircraft problems, particularly in the pitot static or angle of attack systems, the cheese gets real binding in an exponential manner. But that's why the LSO was saved from the limbo to which he apparently was consigned upon the advent of the optical landing systems.

Incidentally, the "basic four" the board mentioned is not an established term in this locality and can be improved upon greatly by adding "noncomplacency," a priceless ingredient when on the glide slope—or any other time, for that matter—for which there is no acceptable substitute excepting huge quantities of good fortune. In fact, in a routine carrier approach, day or night, the inclusion of "judgment" is questionable unless the term is construed to include knowledge of aircraft handling qualities and perceptiveness.

It is not my purpose to take a backhanded slap at anybody but it should be pointed out that a long hard look has been taken at the night carrier characteristics of all our aircraft. Admittedly the F-8 (F8U) is among the most demanding to bring aboard but in the final analysis, that means simply that it is more intolerant toward complacency or other lapses from good sound procedures.

ROGER CARLQUIST, LCDR
CVG-8 OPERATIONS OFFICER

M-B Seat Check-Off List

Cecil Field, Fla.—With reference to the subject of preflight ejection seat check-off lists, I would like to suggest a technique which I used at NATF (SI) NAS, Lakehurst when we received aircraft from PAR equipped with the F5 (F-8), P5A (F-6A), and M5 (F-3) Martin-Baker seats.

We painted a one inch number on or as close as possible to each item which we felt was a life or death item (i.e., drogue gun trip rod attachment, parachute withdrawal line quick-disconnect, scissors mechanism, etc.). Items were numbered from 1 to 12—a total of 12 numbers were used on all seats for the sake of standardization even though the installations are not identical. Thus all the pilot has to do is follow from number to number in sequence to ensure that those critical items of the seat are checked. If he forgets what he is checking for at item 7, a one sentence explanation is available on a check-off list carried in the safety pin bag on the port side of the seat. Also on this check-off list are about 10 other items of lesser importance which he can check if he wishes to and which the plane captain must check on the first preflight of the day.

This entire concept can be inaugurated at squadron level at no additional expense to the Navy and is a simple and rapid means for pilot preflight. It is hoped that this informal suggestion may be of some value.

S. E. OLMSTEAD, LT
RP VF 174

● **Your ejection seat preflight check-off technique has been forwarded to the U. S. Naval Air Test Center, Patuxent River, Md., for possible use in their Problem Assignment No. 030-AE23-29, Preflight Ejection Seat Check-off Lists; preparation of. Thank you for your interest in aviation safety.**

Dynamic Approach

Detroit, Mich.—Re APPROACH, April '63. The various articles which concerned fuel contamination, as well as problems existing with various contamination removal devices were of special interest. We are one of the leading manufacturers of aircraft/missile and nuclear filtration equipment. Operation and maintenance problems with which the Navy, Army and Air Force are confronted are also problems which confront us daily. Many of the errors in design and manufacture are being corrected and improved as we learn of your experiences.

We have screen type filters, as well as dynamic centrifuges in many Navy aircraft flying today. Therefore, we feel that we should be aware of your problems which exist today, as well as uncover potential problems before they become a reality.

The coverage which you have given contamination devices has convinced me that we should receive this publication on a monthly basis. We will, from time to time, forward information to you concerning contamination and contamination equipment which we feel is in the interest of safety.

R. L. CARMON
CHIEF ENGINEER
DYNAMIC FILTERS, INC.

● **That's dynamic talk, man — glad to oblige.**

Smallest Carrier

FPO, San Francisco—I have been an ardent fan of your magazine for a number of years both as an enlisted Combat Air Crewman and later as an

interested "Black Shoe" officer.

Often in your magazine you mention Ship and Squadron Safety records and I feel it is time this aircraft carrier was mentioned.

The USS TARGATEER, a Drone Aircraft Catapult Control Ship, has been launching and recovering our particular type of aircraft for almost 3 years since being converted to this mission. In this period of time we have not had a single accident attributable to flight operations. Naturally, we have lost no pilots.

We are quite proud of "The World's Smallest Aircraft Carrier" and its safety record.

D. L. PFISTER, LT, C.O.

Crash & Rescue Info

Washington, D. C.—I've been asked to do a rather comprehensive piece on air rescue and crash survival, summarizing the more notable survival cases in Navy, Air Force and civilian records, and outlining what steps the armed services take to train their personnel to cope with problems of crash survival in isolated places. Could you please direct me to the persons or agencies that would be most productive of information in these areas? Many thanks.

VERN HAUGLAND
AVIATION EDITOR
THE ASSOCIATED PRESS

● **Eleven *Approach* survival yarns forwarded together with an appropriate list of civilian and military editors.**

Required Reading

FPO—After reading the excellent article "Memo to Maintenance Men" by R. H. Miller, Safety Officer, VS-26 in the August issue, I have made it required reading for my quality control collateral duty inspectors.

I read this article with deep interest. It made me feel as though Mr. Miller did some spying on some squadrons in which I have served.

THOMAS R. STEPHENS, AMH1
VP-42 QUALITY CONTROL

Pilot's Handbooks

NAS—Proficiency pilots need and should have a pilot's handbook for each type aircraft in which they maintain proficiency. USAF proficiency pilots have same—USN types need them also. I have checked several large staffs in the local area and they do not average one SNB handbook per staff. This is gross! Each pilot should have his own handbook and should receive changes thereto. We all get the answer—"You can check out a handbook from NAS Operations." Try it and I'll bet you can't!

ANYMOUSE

Whistle Bait

Headmouse has received some strong correspondence regarding the humorous item on plastic whistles, page 22, August APPROACH which was apparently somewhat misunderstood. One of the correspondents offered to send a substitute nonplastic whistle for evaluation, if we acknowledged his anonymous note. *How about it?*

Crossfeed

Naha, Okinawa—The 51st Fighter Interceptor Wing at Naha AB enjoys a fine working relationship with certain tenant units, namely VU-5, VP-4 and ComFleActs, Ryis. The safety officers cooperate and collaborate in several areas, and one benefit accruing to the 51st Fighter Interceptor Wing Office of Safety is a couple of copies of your magazine. We think it's a fine publication, and we certainly aren't above borrowing ideas from you.

Which brings up two requests. One, permission to reprint articles in our base safety publication, Accident Prevention Tips. The other, three copies of MECH '62, for the edification of our airplane maintainers. Thanks in advance for both.

ROBERT D. LANE, CAPT, USAF
FLYING & MISSILE SAFETY OFFICER

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. Views expressed are those of the writers and do not imply endorsement by the U. S. Naval Aviation Safety Center.

Index Customer

George AFB, Calif.—Would you favor us with the cumulative index from July, 1955 to June, 1962 of your magazine? Despite our connections with "another organization," we find your material extremely valuable and apropos to our operation. Thank you in advance.

REPUBLIC AVIATION CORP.
HAROLD POEHLMANN

● **Glad to oblige.**

For the Artists' Hoard

FPO, New York—Here are a bunch of negatives you may be able to use. For our purpose they are no good at all. I would have made prints of them instead but, you know how it is when austerity sets in.

Sure do enjoy seeing the book every month. You have been having some good articles but, I feel that you must be running short of pictures. I have a folder in my desk that is marked for NASC and I toss everything that I can't use into it. Some of it may be useful for artwork.

J. WILLIAMS, PHC
USS ENTERPRISE

● **Thanks, Chief—we hope others take the hint.**

Attention Firefighters

Washington, D.C.—The Navy will soon employ a turbine jet engine for the first time in an aircraft crash fire vehicle for test and evaluation. The Bureau of Naval Weapons has awarded a contract to incorporate the engine in the truck.

An existing Navy MB-5 crash truck will be modified to accommodate a Boeing 502 gas turbine engine, which develops 330 horsepower and weighs only 325 pounds, one-tenth of the weight of a conventional engine.

It is expected that the turbine-powered fire apparatus will be able to accelerate from zero to 60 miles-per-hour in 30 seconds or less! The modification should also permit the truck to "drive into" a fire with its turret foam nozzle in full operation and hand lines operable if required, an important factor in combating airport fires.

While the crash truck is the first of its type, jet driven fire pumper trucks and aerial ladder trucks have previously been delivered to municipal fire departments.

NAVNEWS

approach

NavWeps 00-75-510 VOL. 9. No. 5

Our product is safety, our process is education, and our profit is measured in the preservation of lives and equipment and increased mission readiness.

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Aero-Medical

Maintenance

Departments

RADM Edward C. Outlaw Commander, U.S. Naval Aviation Safety Center

CDR T. A. Williamson, Jr.
Head, Safety Education Dep't

A. Barrie Young, Jr.
Editor

J. A. Bristow
Aviation Medicine/Survival Editor

LCDR J. R. Foster
Managing Editor

Robert Trotter
Art Director

LT G. W. Lubbers
Flight Operations Editor

Blake Rader
Illustrator

J. T. LeBarron
Research/Ass't Flight Ops Editor

Ray Painter, PHI
Photographer

J. C. Kiriluk
Maintenance/Ass't Managing Editor

F. W. Chapin, JO2
Editorial/Production Associate

CONTRIBUTING DEPTS., NASC

Accident Investigation
Head, Lt Col R. S. Hemstad

Aero-Medical
Head, CAPT E. L. de Wilton, MC

Analysis and Research
Head, CDR F. T. Rooney

Maintenance and Material
Head, CDR D. M. Layton

Records and Statistics
Head, CDR W. H. Hile, Jr.

PHOTO & ART CREDITS: Page 9 Bottom, Right Grumman Aircraft
Page 15 Top Drawing by Hugh Cabot III

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Who Is Responsible for Safety Training?

The answers to this thought-provoking question will depend on the position, attitude, and experience of the person asked. A member of the safety office will say, with deliberation, "In general, we furnish the information and material, but it is up to the stations to do the actual training. We just don't have enough people to train all hands.

A mechanic or cargo handler will tell you, without hesitation, "My boss tells me what to do. I look to him for training in how to work without getting hurt." You can't take exception to either answer. Are they worlds apart? How about all the other levels of management and functional responsibility in-between?

Let's consider the basic philosophies of safety as they apply in this case. The first item is "attitude." Call it policy if you wish. Top management must know its safety goal and state clearly and firmly. The second step is the assignment of responsibility for attaining that goal. They must make it understandable to all levels of management that the safety goal must be sought as vigorously as the service or economic goals.

It is generally acknowledged that the supervisor can best carry out his responsibilities for safety along with his regular duties. If we agree that safety and supervision cannot be separated, then we must agree that safety training is the supervisor's responsibility. The safety office can feed in the raw material, and the supervisor produces the finished product.

Have we answered the question? Probably, the only honest answer from every member of management, regardless of level, is, "I am responsible for safety training." — *G. T. Murray, Specialist — Ground Safety, American Airlines*

Inspect it like you were going to buy it for cash with no guarantee.

Start it like an evening on the town; with a careful check around.

Taxi it like the tightrope walker. When he puts his foot down he knows where the wire is.

...IT'S YOUR AIRPLANE

(FLY IT WISELY)

Take it off like you tried to on your first solo.

Fly it like the first time you drove that red convertible home.

Land it as if the last box of eggs on earth were lying loose in the cargo hold.

Shut it down as if the CO and OPS officer were waiting to give you the Pilot-of-the-Month Award.

Write it up as though you were getting paid ten cents a word.